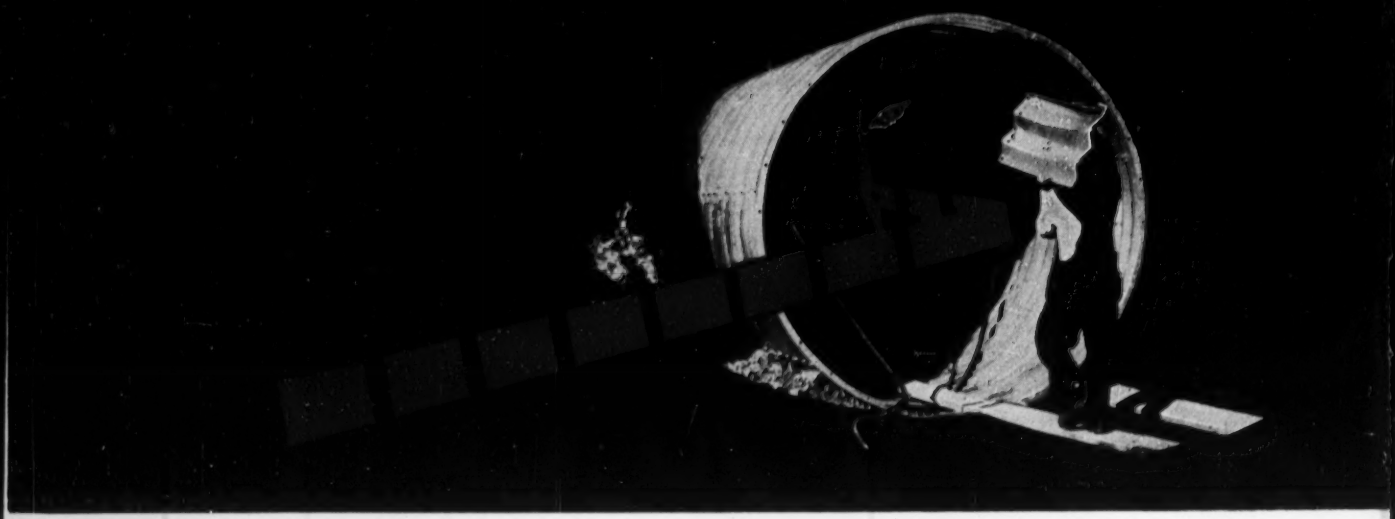
ENGINEERING NEWS-RECORD

A McGRAW-HILL PUBLICATION



They saved money going into a hole

It didn't seem right to tear up expensive surface installations, divert traffic and disrupt business when installing underground structures. Tunneling was the logical alternative, but old-time methods made it a laborious, time-consuming job. Armco engineers felt sure there must be a better, less expensive way.

The result was Armco Tunnel Liner . . . a new type of plate having lapped joints and corrugated metal design to provide utmost strength with the least bulk and weight. Now one or two unskilled workman can carry, hold and bolt into place an Armco Liner Section. Only a structural wrench is needed. The tunnel is uniformly strong. Labor costs are low and the job goes fast. Less bulk means less excavation and storage requirements are smaller. You buy no excess metal.

Making products simpler and more efficient has been a prime goal at Armco for more than 40 years. So has the designing of products to meet specific needs. Today you can bring your drainage and construction problems to Armco with full assurance that you will receive all the benefits of long experience, extensive research facilities and a real interest in helping to solve them.

Armco has a complete range of engineered products and convenient, authoritative data to help you. If your problem is difficult or unusual why not talk it over with us.

ARMCO

ARMCO DRAINAGE & METAL PRODUCTS, INC.

Subsidiary of Armco Steel Corporation • Middletown, Ohio

ROCK RATED

before it ever reached the pit!

Look at the development behind the P&H Model 1055 and you see why this 3½-yd. shovel can outproduce machines of greater rated capacity.

It's the one rock shovel built completely from progressive ideas. P&H was first with the added strength of welded steel construction . . . the pioneer in better weight distribution to let you use full digging power at tooth point . . . the leader in cushioned hydraulic control. And it's P&H with revolutionary Magnetorque* that swings you through a faster, smoother cycle in any kind of weather. Count on *15% additional rock production* from this P&H advancement alone!

There's a companion P&H 955A Shovel in the 2½-yd. class equally as outstanding. Write today for further facts about either model.

with P&H MAGNETORQUE* ELECTRIC SWING

. . . FRICTION FREE

. . . . TROUBLE FREE

Lasts the life of the machine!

*T.M. of Harnischfeger Corporation for electro-magnetic type coupling.

P&H LARGE EXCAVATOR DIVISION

HARNISCHFEGER CORPORATION

MILWAUKEE 46, WISCONSIN

the P&H Line

TRUCK CRANES · DIESEL ENGINES · POWER SHOVELS · PREFABRICATED HOMES · HOISTS · SOIL STABILIZERS · WELDING EQUIPMENT · OVERHEAD CRANES

Watch Every Buck— . . . *Carefully!*

Actually it's not how many bucks you shell out on original costs that count—it's *how much do you save* in erection time and in on-the-job performance. Here are the kind of *savings that count:* can you scaffold higher with fewer panels and parts? can you position plank-bearing brackets at intermediate levels? can you place material at hip-level where your mason can work easier and faster? There's one answer . . . you *can* with Universal Ezebilt Mason Panels, and we don't just make the claim—we show you how. You'll have a time-saver, a buck-saver and a life-saver with **UNIVERSAL Ezebilt SCAFFOLDING**

SU PANELS

Provide open bay for easy handling of planks and four plank bearing levels.

SUX PANELS

Provide three plank bearing and bracket rest levels.

Write for New Informative Catalog

Distributors offer planning help and fast deliveries from Sales and Rental Stocks . . . See your phone directory

UNIVERSAL MANUFACTURING CORP.
ZELIENOPLE 3, PA.

ENGINEERING NEWS-RECORD

ABP Member ABC

Editorial offices, 330 W. 42 St., New York 36, Tel. LOngacre 4-3000

Number of copies of this issue printed, 63,323

CONTENTS ON PAGE 17

Waldo G. Bowman

Editor

E. E. Halmos, Jr. ..... *Managing Editor*

J. J. Christie ..... *Asst. Managing Editor*
V. T. Boughton ..... *Transportation, Power*
F. S. Merritt ..... *Architectural, Structural*
R. H. Dodds ..... *Contracting, Heavy Construction*
S. C. Jensen ..... *Materials and Equipment*
A. J. Fox, Jr. ..... *Hydraulics, Water Supply, Sanitation*
G. T. Orick ..... *Labor, Men and Jobs*
J. P. Chamberlain ..... *Business and Finance*
R. W. O'Neill ..... *International, National Affairs*
J. R. Owen ..... *Municipal*
J. R. Carr ..... *Midwest (Chicago)*
L. L. Wise ..... *West (San Francisco)*
N. A. Bowers ..... *Consultant (San Francisco)*
Elsie Eaves ..... *Business News Department*
J. H. Webber ..... *Economics*
J. A. Mahoney, M. O. Wetzel ..... *Construction Reports*
M. W. Roessler, E. R. Huber ..... *Statistics, Costs, Prices*
M. V. Leggiero ..... *Makeup*
T. D. MacGregor, B. J. Lamb, B. J. Bagley ..... *Copy, Rewrite*
L. T. Tarpey, J. C. Greenough ..... *Printing*

Washington News Bureau, Room 1189 National Press Building; G. B. Bryant, Jr., *Manager*, Glen Bayless, A. E. Adams, Jay Flocken, Boyd France, Sam Justice, Craig Lewis, D. O. Loomis, Jesse Mock, Gladys Montgomery, A. L. Moore, William Olcott, M. A. Reichek, Caroline Robertson, J. T. Skelly, V. B. Smith.

Domestic News Bureaus: Atlanta, 1321 Rhodes-Haverty Bldg., W. A. Kearns; **Cleveland,** 1510 Hanna Bldg., R. A. Cochran; **Detroit,** 856 Penobscot Bldg., J. C. Jones Jr.; **Houston,** 1303 Prudential Bldg., J. A. Lee; **San Francisco,** 68 Post Street, M. C. Ralston; **Los Angeles,** 1111 Wilshire Blvd., John Shinn; **Seattle,** 6040 Fifth Ave., N.E., Ray Bloomberg.

Correspondents: Albany, Albuquerque, Augusta, Me., Austin, Boston, Boulder, Baltimore, Birmingham, Bismarck, Charleston (W. Va.), Charleston (S. C.), Columbus, Cincinnati, Cleveland, Chicago, Cheyenne, Dallas, Denver, Detroit, Durham, Harrisburg, Helena, Houston, Hartford, Indianapolis, Jackson, Miss., Jacksonville, Jefferson City, Kansas City (Mo.), Lansing, Lincoln, Little Rock, Miami, Memphis, Minneapolis, Montgomery, Milwaukee, New Orleans, Norfolk, Omaha, Oklahoma City, Philadelphia, Pittsburgh, Portland (Ore.), Providence, Phoenix, Pierre, St. Louis, Schenectady, Syracuse, St. Paul, Seattle, Salt Lake City, Spokane, Topeka, Trenton, Wilmington. **Canada:** Montreal, Toronto, Ottawa, Victoria, Regina.

Foreign News Bureaus: J. K. Van Denburg, Jr., **New York;** G. W. Schroder, **Bonn;** Edward W. S. Hull, **London;** Herbert Leopold, **Manila;** John Wilhelm, **Mexico City;** John O. Coppock, **Paris;** A. W. Jessup, **Tokyo;** L. J. Holmes, **Sao Paulo. Correspondents:** Amsterdam, Athens, Bangkok, Bogota, Bombay, Brussels, Buenos Aires, Caracas, Copenhagen, Geneva, Havana, Helsinki, Johannesburg, Lima, Madrid, Melbourne, Oslo, Rome, Stockholm, Sydney, Tehran, and 21 other principal cities and countries.

Robert F. Boger

Publisher

JUNE 17, 1954 ENGINEERING NEWS-RECORD Vol. 152, No. 24

Member ABC and ABP

Published weekly by McGraw-Hill Publishing Company, Inc., James H. McGraw (1860-1948), Founder. **Publication Office, 99-129 North Broadway, Albany 1, N. Y.**

Executive, Editorial and Advertising Offices: McGraw-Hill Building, 330 W. 42nd St., New York 36, N. Y. Donald C. McGraw, President; Willard Chevalier, Executive Vice-President; Joseph A. Gerardi, Vice-President and Treasurer; John J. Cooke, Secretary; Paul Montgomery, Senior Vice-President, Publications Division; Ralph B. Smith, Vice-President and Editorial Director; Nelson Bond, Vice-President and Director of Advertising; J. E. Blackburn, Jr., Vice-President and Director of Circulation.

Subscriptions: Address correspondence to Engineering News-Record—Subscription Service, 99-129 North Broadway, Albany 1, N. Y., or 330 W. 42nd St., New York 36, N. Y. Allow one month for change of address. Subscriptions are solicited only from persons with an identifiable commercial or professional interest in construction and building. Position and company connection must be indicated on subscription orders.

Single copies 35¢. Subscription rates—United States and possessions, $6.00 a year; $9.00 for two years; $12.00 for three years. Canada $8.00 a year; $12.00 for two years; $16.00 for three years. Other Western Hemisphere countries, $15.00 a year; $25.00 for two years; $30.00 for three years. All other countries, $20.00 a year; $30.00 for two years; $40.00 for three years. Entered as second class matter October 29, 1936, at the Post Office at Albany, N. Y., under Act of Mar. 3, 1879. Printed in U. S. A.

Copyright 1954 by McGraw-Hill Publishing Co., Inc.—All Rights Reserved.

NUMBER 22 NORTHWEST

for Rusciano & Son Corp. New York, N. Y.

LOOK at that digging! That's the kind of stuff they hit on large parts of the New York Thruway. Digging like that takes a *real* Rock Shovel. It takes the extra digging power of the Northwest Dual Independent Crowd and the rugged strength of Northwest Design.

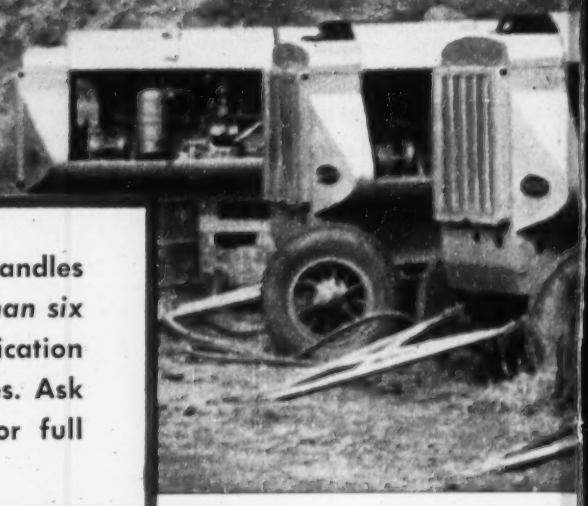
These and other Northwest advantages are behind the fact that nearly 90 Northwest machines were used on the Thruway. And, Northwest advantages are behind the fact, too, that Rusciano & Son Corp. have just purchased their 22nd Northwest. There is no better reason for your getting the full details on Northwest equipment before you buy.

NORTHWEST ENGINEERING COMPANY
1502 Field Bldg., 135 South La Salle Street, Chicago 3, Ill.

NORTHWEST

CRAWLER and TRUCK MOUNTED SHOVELS • CRANES • DRAGLINES • PULLSHOVELS

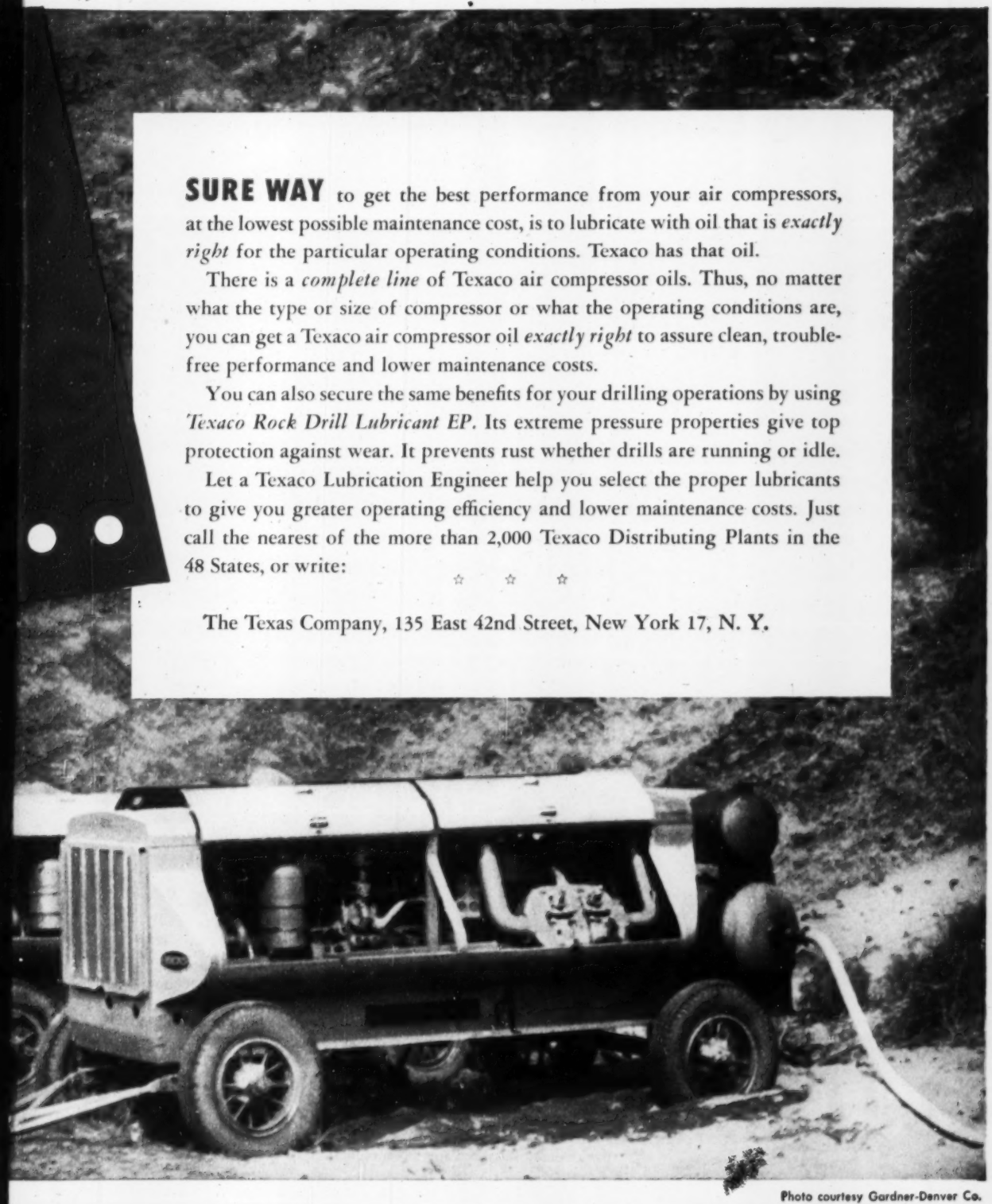
HOW TO BRING DOWN COMPRESSOR MAINTENANCE COSTS . . .



SIMPLIFIED LUBRICATION PLAN — Handles *all* major lubrication with *no more than six lubricants.* The Texaco Simplified Lubrication Plan saves time, money and mistakes. Ask your Texaco Lubrication Engineer for full details.

TEXACO

TEXACO



SURE WAY to get the best performance from your air compressors, at the lowest possible maintenance cost, is to lubricate with oil that is *exactly right* for the particular operating conditions. Texaco has that oil.

There is a *complete line* of Texaco air compressor oils. Thus, no matter what the type or size of compressor or what the operating conditions are, you can get a Texaco air compressor oil *exactly right* to assure clean, trouble-free performance and lower maintenance costs.

You can also secure the same benefits for your drilling operations by using *Texaco Rock Drill Lubricant EP.* Its extreme pressure properties give top protection against wear. It prevents rust whether drills are running or idle.

Let a Texaco Lubrication Engineer help you select the proper lubricants to give you greater operating efficiency and lower maintenance costs. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

☆ ☆ ☆

The Texas Company, 135 East 42nd Street, New York 17, N. Y.

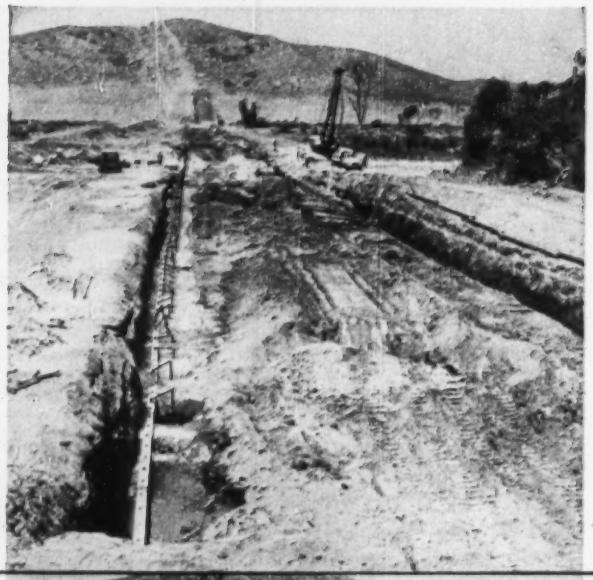
Photo courtesy Gardner-Denver Co.

Lubricants and Fuels

FOR ALL CONTRACTORS' EQUIPMENT

WET

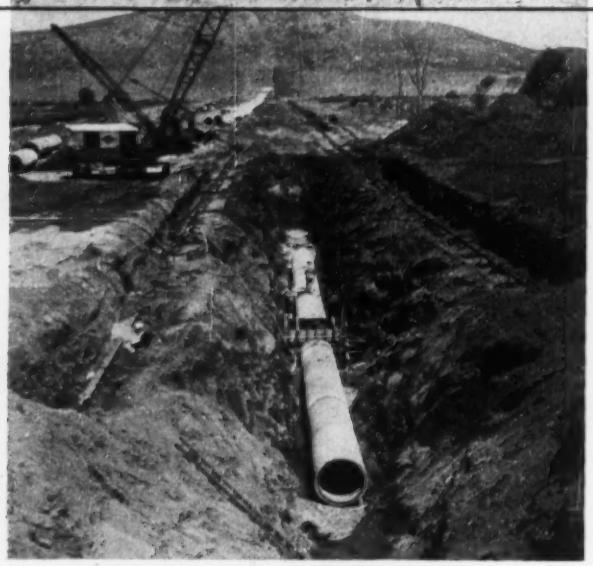
The quicksand is being predrained by efficient operation of Stang Wellpoint System.



to

DRY,

Excavation progresses in the dry. Pipe laid safely on schedule, with no ground water worries.



and

WHY!

U.S. Bureau of Reclamation engineers were faced with a challenging problem on the San Diego Water Supply Project. The San Diequito River Crossing of the San Jacinto-San Vicente Aqueduct called for the laying of 2,000 feet of large diameter concrete pipe in unstable water-bearing soil. Maximum depth was 18 feet below ground water table. After consultation with Stang engineers, a wellpoint system was expertly installed to predrain the work area. Digging "in the dry," the job progressed speedily and economically. Pipe was easily laid as planned. Call on Stang experience and equipment to solve *your* water handling problems—any size, any type, anywhere. 84-page catalog furnished free upon request.

JOHN W.
STANG
CORPORATION

Engineers and Manufacturers of Unwatering Equipment

BELL, CALIFORNIA
8221 Atlantic Avenue
Telephone: LOgan 5-7421

OMAHA, NEBRASKA
2123 South 56th Street
Telephone: WAlnut 7796

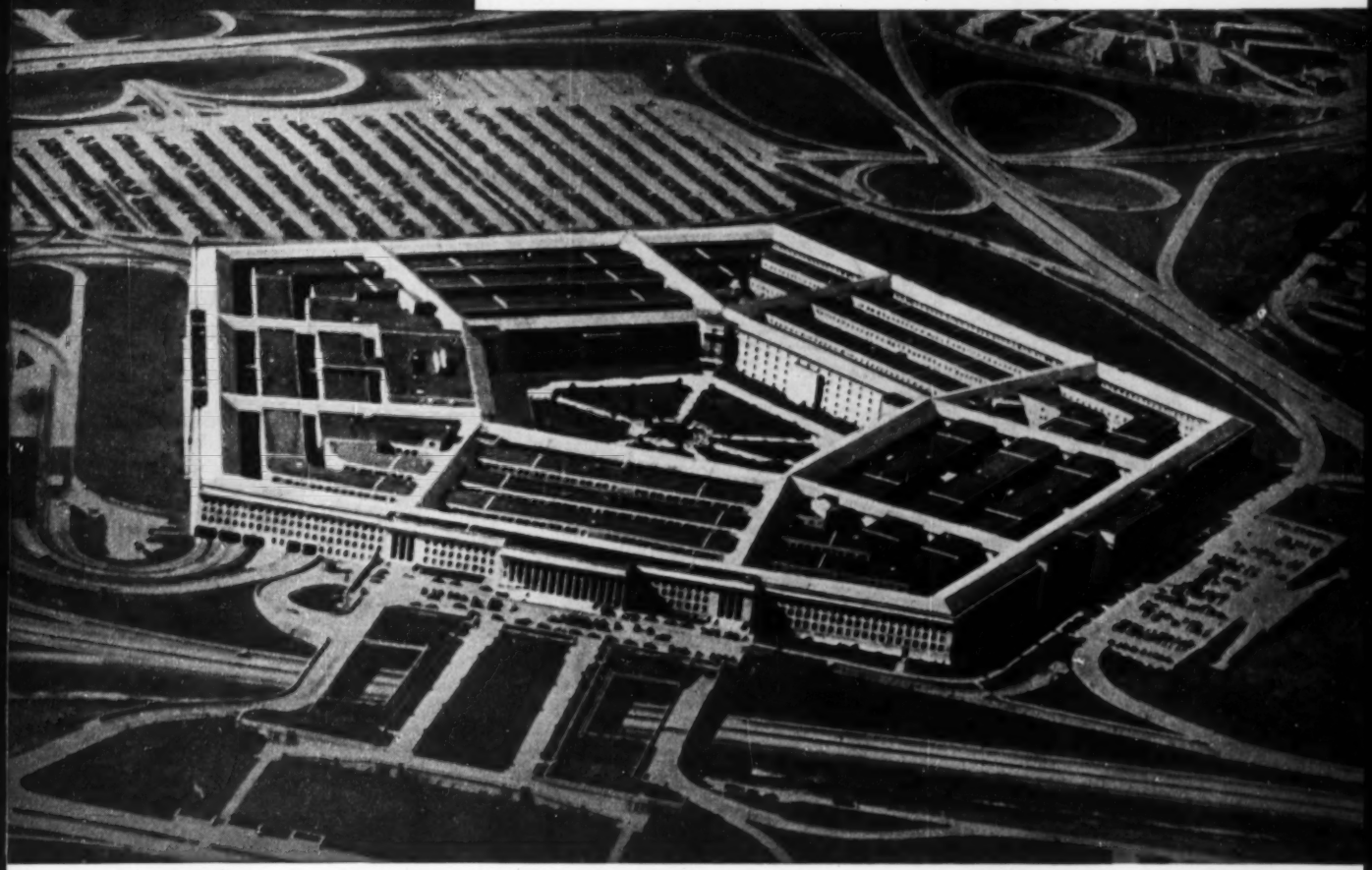
TACOMA, WASHINGTON
2339 Lincoln Avenue
Telephone: BRoadway 4362

NEW YORK, N. Y.
No. 2 Broadway
Telephone: WHitehall 3-0565

Raymond Features!

NUMBER FOUR OF A SERIES

Raymond Piles
HAVE UNIFORM BEARING CAPACITY



THE PENTAGON IN WASHINGTON rests on over 43,000 Raymond Piles varying in length from 16 to 58 feet, all of uniform bearing capacity.

Because Raymond Concrete Pile shells are available in 4, 8 and 12-foot sections, they may be driven to the proper depth to obtain a uniform bearing capacity regardless of the variations in soil conditions. This flexibility also saves time and money by eliminating delays in driving test piles to pre-determine length.

Raymond
CONCRETE PILE CO.
140 CEDAR STREET • NEW YORK 6, N. Y.
Branch Offices in the Principal Cities of United States and Central and South America

AROUND THE WORLD SINCE 1899

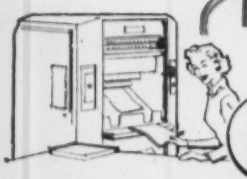
THE SCOPE OF RAYMOND'S ACTIVITIES . . . SOIL INVESTIGATIONS . . . FOUNDATION CONSTRUCTION . . . HARBOR AND WATERFRONT IMPROVEMENTS . . . PRESTRESSED CONCRETE CONSTRUCTION . . . CEMENT-MORTAR IN-PLACE LINING OF WATER, OIL AND GAS PIPELINES

The Only Reproduction Machine That Gives You All 7

1.	√	A Bruning Copyflex makes top quality, low cost, black on white prints fast—in just a few seconds.
2.	√	A Bruning Copyflex has available an unsurpassed variety of sensitized papers, cloths and films.
3.	√	A Bruning Copyflex is precision engineered for a lifetime of trouble-free service.
4.	√	A Bruning Copyflex is simple to operate. Anyone can run it easily and well.
5.	√	A Bruning Copyflex requires only an electric connection to operate.
6.	√	A Bruning Copyflex is absolutely odorless, quiet and clean—no fumes, no exhaust ducts.
7.	√	A Bruning Copyflex requires no permanent installation—is mounted on castors for mobility.

Copyflex Model 93

Many models to choose from—to suit every need, any budget! Write us for full particulars.



BRUNING Copyflex

Copies anything typed, written, printed or drawn on ordinary translucent paper—in seconds.

CHARLES BRUNING COMPANY, INC. • 4700 MONTROSE AVENUE • CHICAGO 41, ILLINOIS

Everything for the Engineer and Draftsman

READER COMMENT

St. Lawrence Seaway

SIR: I know the "News" to be an old established engineering magazine with a splendid reputation and, as far as my limited abilities are able to judge, each issue is replete with articles and information that must be of great value to the members of the engineering profession (especially civil) and to architects and contractors.

Therefore, I cannot see why ENR has always been so keen for the St. Lawrence Seaway.

The issue of June 3 brings to mind Shakespeare's "Consistency thou art a jewel." One article entitled "U. S. Seaway preparations get priority action in Washington" wherein you play up the great advantages of this 27-ft maximum depth channel—certainly not over 24-foot effective depth. What is going to use such a depth?

Now the other side of the consistency picture is the article entitled "Delaware Valley—Its river is key to more construction." In this article, p. 34, is a sub-head "Deeper Channel." This cites the 40-ft channel to Philadelphia, which shoals off to 24 ft upstream to Trenton. It is proposed to dredge this channel to a 40-ft depth, the United States Government to dredge to 35 ft and "local interests" to pay for the added 5 ft to bring the depth to 40 ft. Why 40 ft or even 35 ft? We have just read in the other article where the shipping of the world is going to steam merrily through the St. Lawrence "Seaway" with only 25 ft of depth, or even less, available. It would seem that it is being proposed to spend many, many millions on very, very unnecessary dredging of the Delaware channel.

HERBERT S. NELSON
New Haven, Conn.

Action was by NSPE

SIR: I noted with considerable interest your story relative to the bidding on engineering services in Douglas County, Neb. (ENR May 20, p. 21).

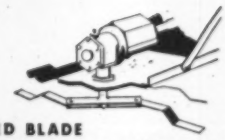
I wish to call your attention to the fact that the Professional Practice and Ethics Committee referred to in your news item is a committee of the Nebraska Society of Professional Engineers, which is a member of the National Society of Professional Engineers.

Although I am a member of both the ASCE and NSPE, it has been my observation that NSPE has been more active and more effective in this type

(*Continued on page 14*)

How to mow shoulders for less!

Dearborn EQUIPMENT



HINGED BLADE

PTO-driven blade folds back when obstruction is hit—helps prevent damage to cutter. Safety clutch protects entire mechanism.

CARRIED BY THE FORD TRACTOR

Ford's Hydraulic System lifts and lowers Rotary Cutter for transport . . . you get to the job in less time.

ADJUSTABLE CUTTING HEIGHT

Adjustable gauge wheel, with puncture-proof tire, accurately controls cutting height from 2 to 10 inches.

New Dearborn Rotary Cutter attached to the Ford Tractor

Neat, clean roadsides—maintained with the new Dearborn Rotary Cutter for pennies instead of dollars—keep taxpayers happy. That's why you'll find more road maintenance men switching to rotary mowing this year than ever before. Just check these advantages:

You save time—The Dearborn Rotary Cutter *keeps moving* in heavy growth. It mows a full 5-foot swath *behind* the tractor rather than to the side—it mows wherever the tractor goes. It has ground-hugging stability that means faster, safer hillside mowing. And its better design eliminates stopping for cans, bottles, rocks and other roadside trash.

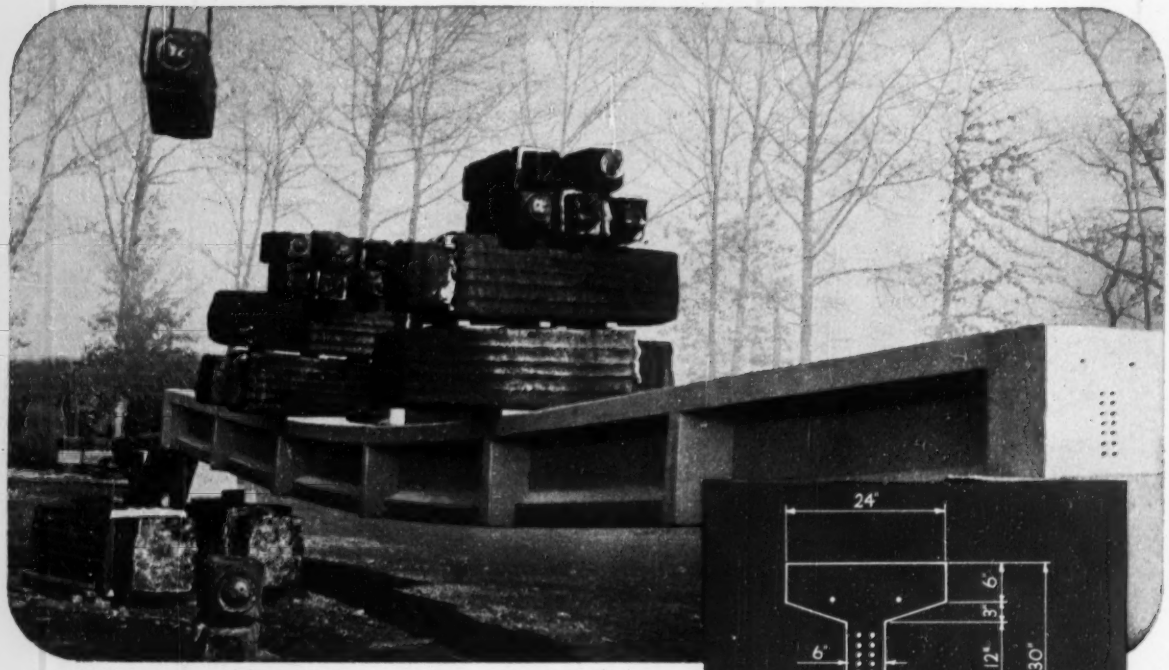
You save money—Priced exceptionally low to start with, the Dearborn Rotary Cutter and Ford Tractor cost far less to maintain. Both are ruggedly built for years of heavy-duty service. The cutter is power driven through a heavy-duty gear box—no belts to replace. And, best of all, there are no sickle bars to buy. Think what this can mean in savings the first season alone!

Find out for yourself how you can maintain more miles of road in less time—for less money—with the Dearborn Rotary Cutter and Ford Tractor. See your nearby Ford Tractor Dealer or write to the address below.

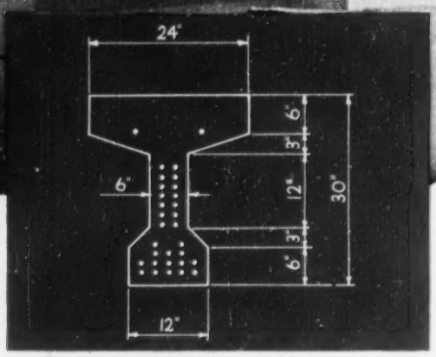
TRACTOR AND IMPLEMENT DIVISION, FORD MOTOR COMPANY
Birmingham, Michigan

Ford TRACTOR

PRESTRESSED CONCRETE BRIDGE BEAM PASSES TEST WITH FLYING COLORS



Just before the break. 34 tons of ingots produce a deflection of about 16 inches.



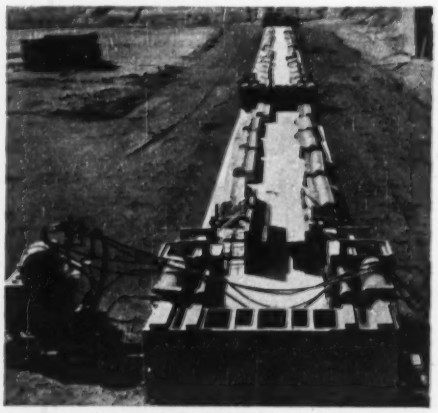
Cross-section of beam tested showing arrangement of Roebling Stress-Relieved Prestressed Concrete Strands to provide over 170 tons compressive force in the beam.

STANDARD PRESTRESSED CONCRETE CORPORATION, White Marsh, Maryland, took a bow on March 5th after testing one of its typical bridge deck members before State, County, and City engineers, and private consultants.

The 62-foot beam, pre-tensioned with thirty-one ⅜-inch Roebling Stress-Relieved Prestressed Concrete Strands, exceeded Bureau of Public Roads requirements by a considerable margin. Deflection under H20-S16-44 live load and impact was .05 foot, only 1/1200 of the span. The ultimate load just before failure was about 17 tons at each third point, well in excess of the required ultimate strength.

This test, conducted under the direction of Dr. Walter C. Boyer of Johns Hopkins University, confirms the dependability of pre-tensioned, prestressed concrete members and of Roebling Tensioning Elements. In addition, the experience of Standard Prestressed Concrete Corporation and other producers confirms the economy of pre-tensioned bonded members for many structures.

Roebling engineers, pioneers in this field in America, are always ready to offer suggestions about prestressed concrete and the tensioning elements best suited to specific applications. Write Construction Materials Division, John A. Roebling's Sons Corporation, Trenton 2, New Jersey.

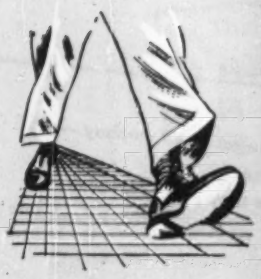


Casting and pre-tensioning bed at White Marsh. 320 feet long, the bed is post-tensioned with 1-inch diameter Roebling Galvanized Prestressed Concrete Strands and produces a variety of beams and other structural members. Note forms along edge of bed.

ROEBLING

Subsidiary of The Colorado Fuel and Iron Corporation

WHERE SAFE WALKWAYS COUNT...



Gary

provides tailor-made, extra strong, safe walkways . . .

WELDED OPEN STEEL FLOORING

In appearance, design, construction—Gary Welded Grating is outstanding for all open steel flooring and stair tread installations. One piece construction, with main bearing bars and *hexagonal cross bars*, resistance-welded means stronger, longer lasting flooring. Tops of all bars are flush and it is self-cleaning, providing the utmost in safety. Main bars on $1\frac{3}{16}$″ centers and cross bars on 4″ centers, in panels 36″ wide and lengths to 40′0″. Also available in a variety of special types with spacing of bars to suit your requirements. Gary Welded is tailor-made, factory-fabricated to your specifications—a big saving for you in installation time and expense. For illustrations of Gary Grating and Stair Treads in use and complete description of all Gary products, send for Catalog EN-64.

Standard Steel Spring Division

ROCKWELL SPRING AND AXLE COMPANY

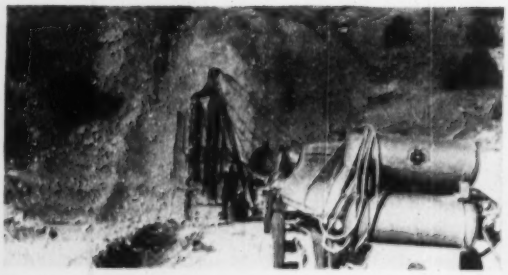
4004 East Seventh Avenue • Gary, Indiana

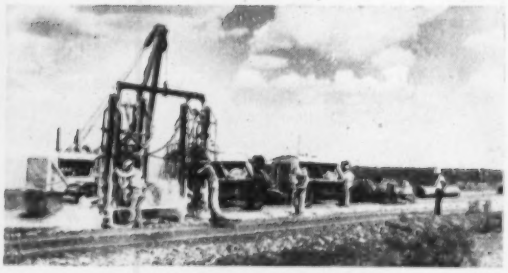
FREE SAMPLE

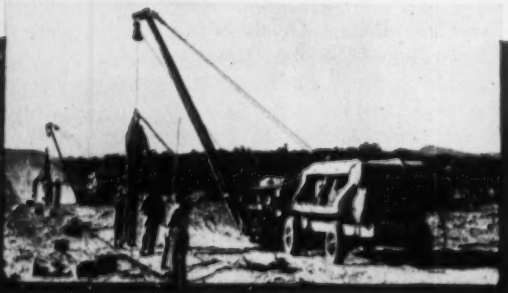
Write us on your company stationery. We'll send handy paper weight size sample.

CONTRACTOR: R. H. Fulton & Company
PROJECT: 30-inch gas line for El Paso Natural Gas Company — 252 miles, from Corona to Gallup, New Mexico
ALTITUDE: Over the Continental Divide at 8,000 to 9,000 feet
TEMPERATURE: Mid-winter temperatures as low as 10° below zero
High summer temperature: 110°
ROCK: Hard malapai, lava, sandstone

GARDNER-DENVER HELPS LICK ANOTHER







GARDNER-DENVER

AIR EQUIPMENT EXCLUSIVELY CHOSEN

...for this tough pipeline project

The right equipment:

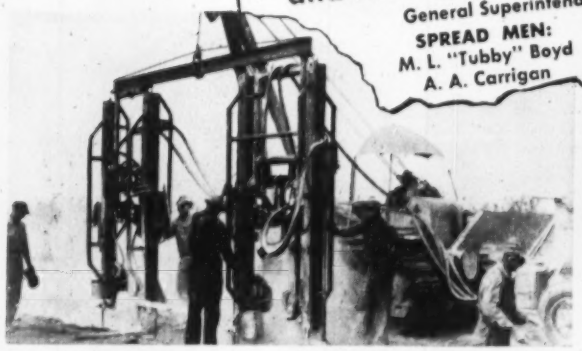
11— WH-600D Portables
14— WH-500D Portables
2— WB-210 Portables
2— WH-105 Portables
20— RMT99 Twindrils
Plus hand-held sinkers and breakers

and the right men for the job:

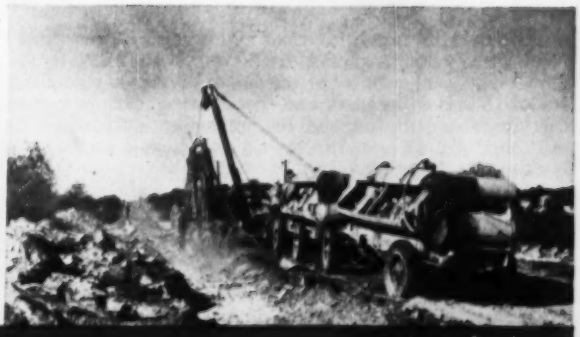
General Superintendent for R. H. Fulton & Company: Clark Williams

SPREAD MEN:
M. L. "Tubby" Boyd
A. A. Carrigan

DITCH MEN:
Walter Lewis
Clint Shell



"IMPOSSIBLE" JOB!



GARDNER-DENVER

Specify

PLYGLAZE®

CONCRETE FORM PANELS

HERE'S a form material that gives you the size and strength of Exterior plywood—plus extra stamina supplied by glass-smooth, flint-hard fused resin-fiber surfaces. Plyglaze is a quality material. Its all around superiority and cost-cutting features have been proved on job after job—on the big ones like Parklabrea and the new Statler Hotel in Los Angeles . . . on homes and small commercial buildings . . . on dams, bridges and other construction projects.

SMOOTHER SURFACES EVERY TIME—Hard, non-absorbent, glossy surfaces give you really smooth concrete. *An absolute minimum of finishing is required.* You cut costs, get a far better job.

UP TO 200 RE-USES—Tough, virtually indestructible surfaces mean maximum re-use. Over 200 re-uses have been reported. Treat it with care, plan and build the forms for long service, and you, too, can get uses up in the hundreds. Comes in standard 4′ x 8′ panels; ½″, ⅝″ and ¾″ thicknesses. Other sizes on special order.

WRITE FOR DATA on Plyglaze Concrete Form Panels: St. Paul & Tacoma Lumber Co., Dept. EN, Tacoma 2, Wash.

ST. PAUL & TACOMA LUMBER CO. TREE LIFE FOREST PRODUCTS ESTABLISHED 1905

ANOTHER MEMBER OF THE FAMOUS TREE LIFE FOREST PRODUCTS FAMILY

READER COMMENT

of work than has ASCE, probably by virtue of the fact that NSPE represents the professional interests of all the engineers, not the civil engineers only.

S. A. MICHAEL
Kirkham, Michael & Associates
Consulting Engineers
Omaha, Neb.

Correction

SIR: On Page 27 of the May 20 issue of the ENGINEERING NEWS-RECORD we notice that under *Jobs in the News*, "Lift-slab Office", you state that Giffels & Vallet, Inc., Detroit, Mich., are architects-engineers for the office building for the Ford Motor Company.

We wish to advise you that we have been commissioned to do this work.

EBERLE M. SMITH
Eberle M. Smith Associates, Inc.

(Editor's note: The information in Jobs in the News also suffers from a typographical error: the cost of the job should read $5½ million, not $15½ million.)

Credit due

SIR: The article entitled, "New Look for an Old Frame," in the May 20 issue of the ENGINEERING NEWS-RECORD is a very good one, but it neglected to mention the name of the structural engineer, Strobel and Salzman. William R. Goerke was the supervising engineer.

JOSEPH SALZMAN
Strobel and Salzman
Consulting Engineers
New York City

CALENDAR

Conference on Thin Concrete Shells, Massachusetts Institute of Technology, Cambridge, Mass., June 21-23.

Third International Water Supply Congress, London, England, June 20-23 (Secretary General, L. Miller, 34 Park Street, London W 1).

Pan-American Congress on Roads, Caracas, Venezuela, July 11-21.

Inter-American Congress of Sanitary Engineering, Sao Paulo, Brazil, July 25-31.

Conference on new developments in engineering design, Virginia Polytechnic Institute, Blacksburg, Va., Aug. 4-6.

National Council of State Boards of Engineering Examiners, annual meeting, Hotel Saint Paul, St. Paul, Minn., Aug. 26-28.

American Water Works Assn., fall meeting, Montauk Manor, Montauk, N. Y., Sept. 9-10.

New England Water Works Assn., Dixville Notch, N. H., Sept. 13-15.

National Highway Conference of County Engineers and Officials, ARBA, Deshler-Hilton Hotel, Columbus, Ohio, Sept. 13-15.

Society for Experimental Stress Analysis and International Congress and Exposition: Bellvue-Stratford Hotel, Philadelphia, Pa., Sept. 21-23.

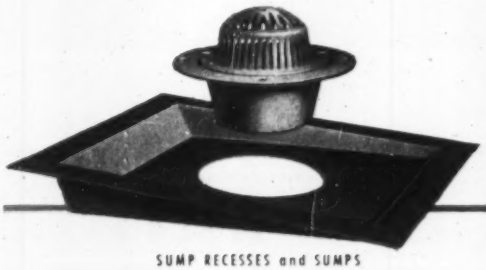
STEEL DECK...

BUILT-UP SADDLES ELIMINATED

Built-up saddles are eliminated in Steel Deck Roofs. Purlins can be set to create valleys at sump locations in the drainage area. Steel Deck can be warped to conform. No additional deck plates are required—no cutting, fitting or bending necessary.

Now Provides SAFEST ROOF, and it is the LOWEST COST ROOF Obtainable!

A new concept in roof construction adds to Steel Deck's many advantages over other types of deck material. An effective, new type vapor seal provides safeguard against pitch seepage under extreme fire conditions. Now, more than ever before, Steel Deck is the most practical deck material available for modern roof construction. Year after year, Steel Deck roofs a greater percentage of new construction. The reason for this is simple . . . the over-all cost of a Steel Deck Roof is less than any other type of permanent, firesafe material. Steel Deck's light weight, and the fact that it can be insulated to the exact degree to meet local requirements, permits substantial savings in the supporting structure—total dead roof load will prove to be less than any other type in any given locality. Mahon Steel Deck is available in Galvanized or Enamel Coated Steel . . . stiffening ribs are vertical—no angular or horizontal surfaces where troublesome dust may accumulate. In the enamel coating process, the metal is chemically cleaned, phosphated, and treated with a chromic acid solution to provide paint bond, and the protective coating of synthetic enamel is baked on at 350° F. prior to roll-forming. Consider these extra-value features . . . See Sweet's Files for complete information, or write for Catalog B-54-A.



SUMP RECESSES and SUMPS

Mahon Roof Sump Recesses for use with Mahon Steel Deck can be furnished to fit any roof pitch. Mahon Cast Iron Sumps can also be furnished for 4", 5", and 6" conductors.

THE R. C. MAHON COMPANY

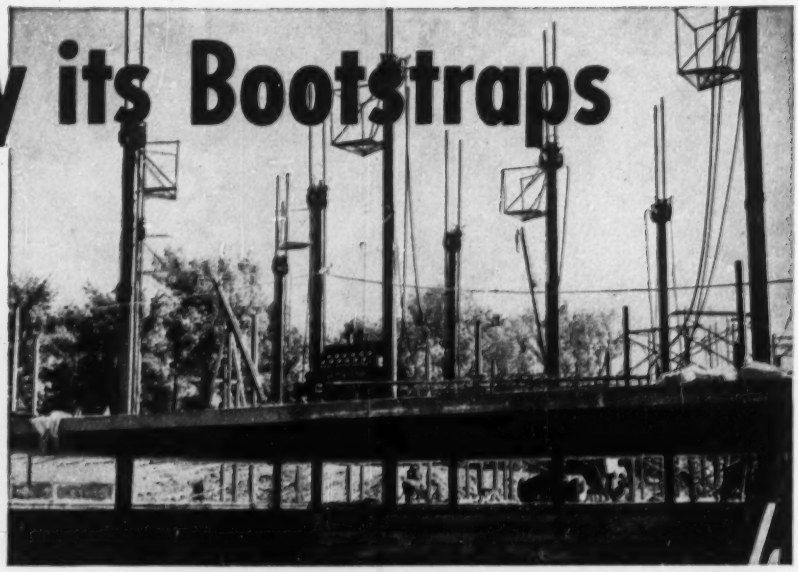
Detroit 34, Michigan • Chicago 4, Illinois • Representatives in all Principal Cities

Manufacturers of Steel Deck for Roofs, Partitions, and Permanent Concrete Floor Forms; Insulated Metal Walls of Aluminum, Stainless or Galvanized Steel; Insulated Metal Wall Panels; Rolling Steel Doors, Grilles, and Underwriters' Labeled Rolling Steel Doors and Shutters.

MAHON

Raised by its Bootstraps

New Hallmark Greeting Card Factory Building Constructed by Lift-Slab Method

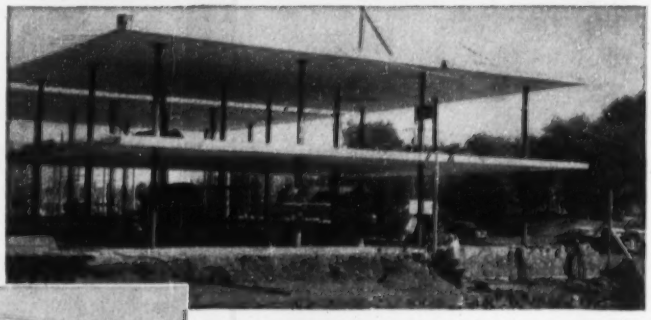


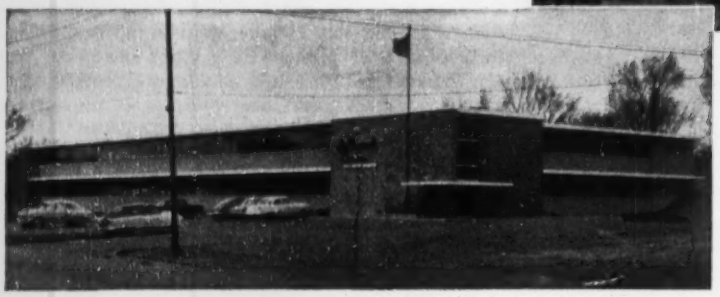
● More than two million greeting cards a day leave the Hallmark production lines—cards distinguished in design and execution, characteristics which have their counterpart in Hallmark's new branch factory building, near Kansas City.

Utilizing the Youtz-Slick Lift-Slab Method, concrete slabs were poured on the main floor, one on top of the other, then lifted into place by hydraulic hoisting equipment, with jacks operated automatically from a control panel. After slabs reached design elevation, steel blocks were welded to columns to support the slabs. And it is quality construction throughout—concreted with Lone Star, hallmark of quality.

Next thing to lifting a building by its bootstraps, the Lift-Slab method saves substantially on forms, eliminates shoring, minimizes material-hoisting costs. For further economy, concrete the last slab with 'Incor'* 24-Hour Cement—start lifting 2 or 3 days sooner.

*Reg. U.S. Pat. Off.





HALLMARK CARDS—Factory Building
Westwood Branch, Johnson County, Kansas

Architects-Engineers:
WELTON BECKET AND ASSOCIATES, Los Angeles, Cal.

General Contractor:
LONG CONSTRUCTION COMPANY, Kansas City, Mo.

Ready-mix Lone Star Concrete:
CONCRETE MATERIALS, INC., Kansas City, Kansas
STEWART SAND & MATERIAL COMPANY, Kansas City, Missouri

LONE STAR CEMENTS COVER
THE ENTIRE CONSTRUCTION FIELD

LONE STAR CEMENT CORPORATION

Offices: ABILENE, TEX. • ALBANY, N.Y. • BETHLEHEM, PA. • BIRMINGHAM
BOSTON • CHICAGO • DALLAS • HOUSTON • INDIANAPOLIS
KANSAS CITY, MO. • NEW ORLEANS • NEW YORK • NORFOLK
PHILADELPHIA • RICHMOND • ST. LOUIS • WASHINGTON, D.C.

LONE STAR CEMENT, WITH ITS SUBSIDIARIES, IS ONE OF THE WORLD'S LARGEST CEMENT PRODUCERS: 18 MODERN MILLS, 136,000,000 SACKS ANNUAL CAPACITY

ENGINEERING NEWS-RECORD

Number of copies of this issue printed: 63,323

Vol. 152, No. 24 June 17, 1954

CONTENTS

NATIONAL AFFAIRS

'54 construction outlook takes optimistic turn 21
Congress boosts appropriation bills 22
Aluminum skin held by rails 23
Spur to Post Office construction seen in pending lease-purchase legislation 24
County officials urge law revisions 24
Single federal projects agency asked 25
Hampton Roads dredging disposal area will provide 25-year dumping ground 26
Toll road feasibility study ordered by Arkansas 26
Florida toll road agency orders new traffic study ... 27
Jobs in the news 27

FEATURES

Thruway pushes onward to New York City 30
Test reactor aids atomic power plant design 40
Heat being conquered at Tecolote Tunnel 45

MUNICIPAL

Dredgemen and divers win Biscayne Bay race 54
Water "giveaway" probe produces results in Philadelphia 56

INTERNATIONAL

Waneta Dam: It's almost ready to power chemical plants 60
Kuwait sets a new schedule for its development scheme 60
Israel has $1½-billion plan for Middle East irrigation 65

MEN AND JOBS

Irving Huie: The man who finds water for New Yorkers 68

BUSINESS AND FINANCE

Joint ventures: More and more of them 124
The longer look 126
May housing starts are 106,000, 4% below April ... 127
Two small steel producers cut structural prices 127
Activity this week 127

NEW PRODUCTS

Belt drive thrives on shock loads 143
Water, sewage treatment simplified with telemeter 143
Concrete plant water meter capacity raised to 300 gpm 144
Pint-sized water cooler has 10-gal per hr capacity .. 144
Magnetic meter reader prints record on tape 144
Hydrohoe now has wrist-action dipper 144
Spreader designed for small jobs 147
V-6 diesel designed for Page walking draglines 147
Luminaire designed for latest 6-ft. street lamps 148
Publications 150

Reader Comment 8
Calendar 14
Washington Observer .. 19
Engineering News-Pictures 28
Obituaries 84
Legal 88
Construction Reports .. 94
Unit Prices 123
Editorials 152

THE CONSTRUCTION WEEK

DON'T HOLD YOUR BREATH—Traffic movements over that test road of the Western Association of State Highway Officials at Malad, Idaho, have ended—but don't expect any information on results soon.

After the furor that was touched off by premature reports on the test road in Maryland a few years ago, the Highway Research Board is keeping a tight lid on all information, until the results have been evaluated fully. Next spring might be a good time to expect the report.

Traffic movement at Malad stopped June 1, following application of 238,000 heavy axle loads to each test pavement (ENR July 3, 1952, p. 36). Flexible pavements 6 to 22 in. thick were tested under axle loads running from 13,000 to 40,000 lb.

NEW INTERNATIONAL BRIDGE?—There are a lot of "doubles" in those plans for a new international bridge between Canada and the U. S. and construction could start on the multi-million-dollar project before the end of this year.

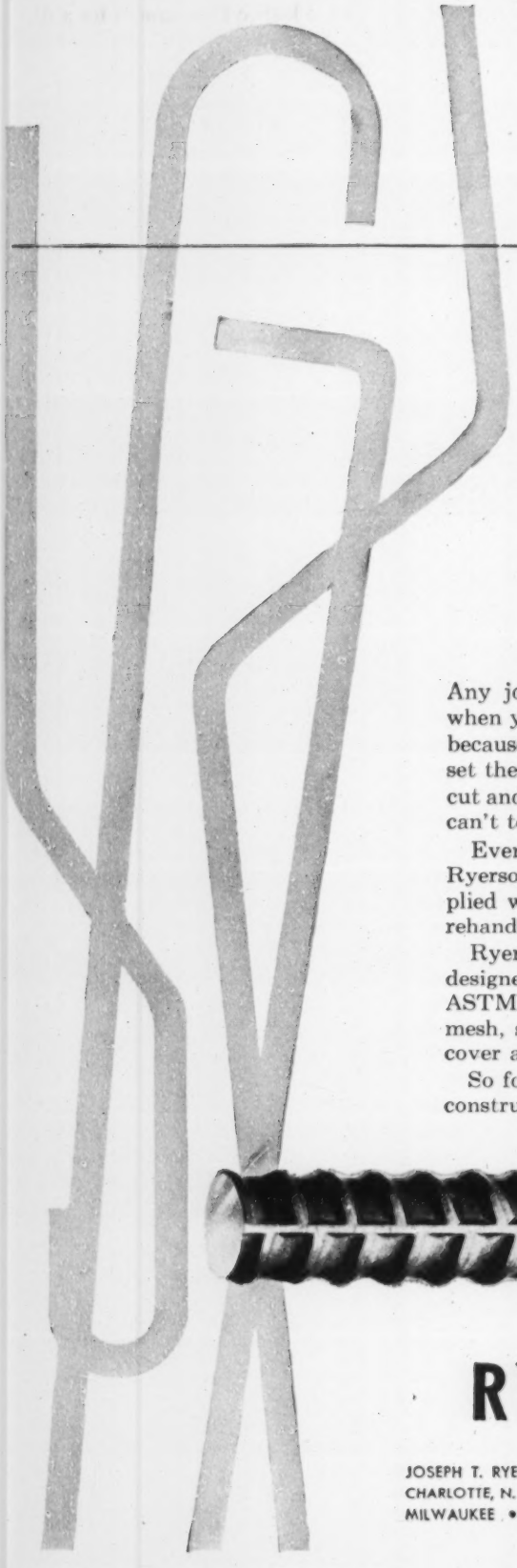
The bridge would cross the St. Mary's River between Sault Ste. Marie, Mich., and Sault Ste. Marie, Ont.; an organization known as the International Bridge Corp., with U. S. and Canadian members has been set up to build it; consultants and traffic experts working on the Mackinac Straits Bridge have promised their cooperation; and the financial houses that backed Mackinac Straits have indicated interest in the new venture.

WHY THE CRASHES?—Pennsylvania's legislators—concerned over mounting accident tolls on the state's own and other highways got a special commission into gear.

Objective: Study fatal highway accident rates; property damage rates; injury rates—see if anything can be developed from these and other studies to determine why and under what conditions the accidents occur. Another study will concern the effectiveness of driver-training programs.

GROUP CONTRACTS—Despite setbacks in lower courts, Columbus building trades unions and employers have gone to the State Supreme Court with their attempt to upset a 1933 state law they say is costing taxpayers millions.

The law forbids combination contracts, grouping of contracts for various types of work on the same project. Builders say that on a recent $150,000 remodeling of a building at Ohio State University, the law caused the state to spend 15% more than it would have if a group contract were allowed.



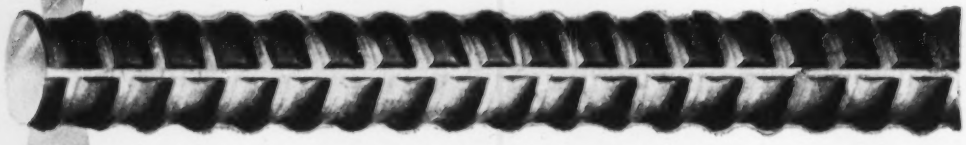
RE-BARS...
cut, bent and tagged
...delivered
ON SCHEDULE

Any job—large or small—moves ahead more smoothly when you depend on Ryerson for reinforcing steel. That's because Ryerson deliveries are absolutely dependable. You set the schedule—we meet it, with steel that's accurately cut and bent—permanently identified by metal tags which can't tear loose.

Even when your job jumps ahead of schedule, large Ryerson facilities enable you to keep crews steadily supplied with steel. But you won't be hampered by costly rehandling of next week's steel piled up on the site.

Ryerson high-bond type reinforcing bars are specially designed for greater grip—guaranteed to meet or exceed ASTM spec. A.305. And Ryerson stocks also include wire mesh, structural steel, floor plate, etc. One contract can cover all your steel requirements.

So for dependable service on re-bars and every type of construction steel, contact your nearby Ryerson plant.



RYERSON STEEL

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • PHILADELPHIA
CHARLOTTE, N. C. • CINCINNATI • CLEVELAND • DETROIT • PITTSBURGH • BUFFALO • CHICAGO
MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO • SPOKANE • SEATTLE

WASHINGTON OBSERVER

FHA is sending a lot more Sec. 608 cases to the Justice Department for a decision on filing either criminal or civil cases. The first bundle contained records on some 70 apartment projects involving more than 200 corporations. Next batch might include 50 to 100 additional projects—and there will be more after that.

Justice Department attorneys are getting "the works"—just about everything FHA has in the way of records and financial reports. The first list of cases got insured loans totaling $277.5 million, while actual cost of construction amounted to only $239.3 million. Of the $39.5 million "windfall," about $31.7 million was distributed to stockholders.

FHA noted that other "windfalls" such as excessive fees which were paid to firms belonging to the promoters are also involved.

FHA says there's "no doubt" that former FHA officials helped many of these promoters boost their profits by helping them through the financial loopholes in the insurance program.

•

FHA rental-housing borrowers still can pay out earned income in dividends under the program to prevent further distribution of "windfall profits." The order says that any change in capital structure or any distribution of capital must be approved first by FHA. In the month or so since the rule has been in effect, no application has come up yet for approval. The rule covers all rental housing—not just Sec. 608 borrowers.

•

There soon will be a lot more political jobs in FHA. Senate has voted to create 18 new $12,000-a-year jobs in FHA outside Civil Service. This move is part of the reorganization plan being worked up by Housing Chief Cole and FHA Chief Norman P. Mason. Congressmen are pushing to get these jobs in the category that has to be approved by the Senate. In effect, this makes them political patronage, pure and simple.

•

There's about $25 million worth of business in grain storage bins at the Department of Agriculture between now and the end of the month. Bids are being asked on some 20,000 metal grain storage bins and about 1,000 "flat storage" buildings. Bids are being made to Commodity Stabilization Service in Washington. Erection contracts will be let throughout the corn-belt states where the bins are to be located.

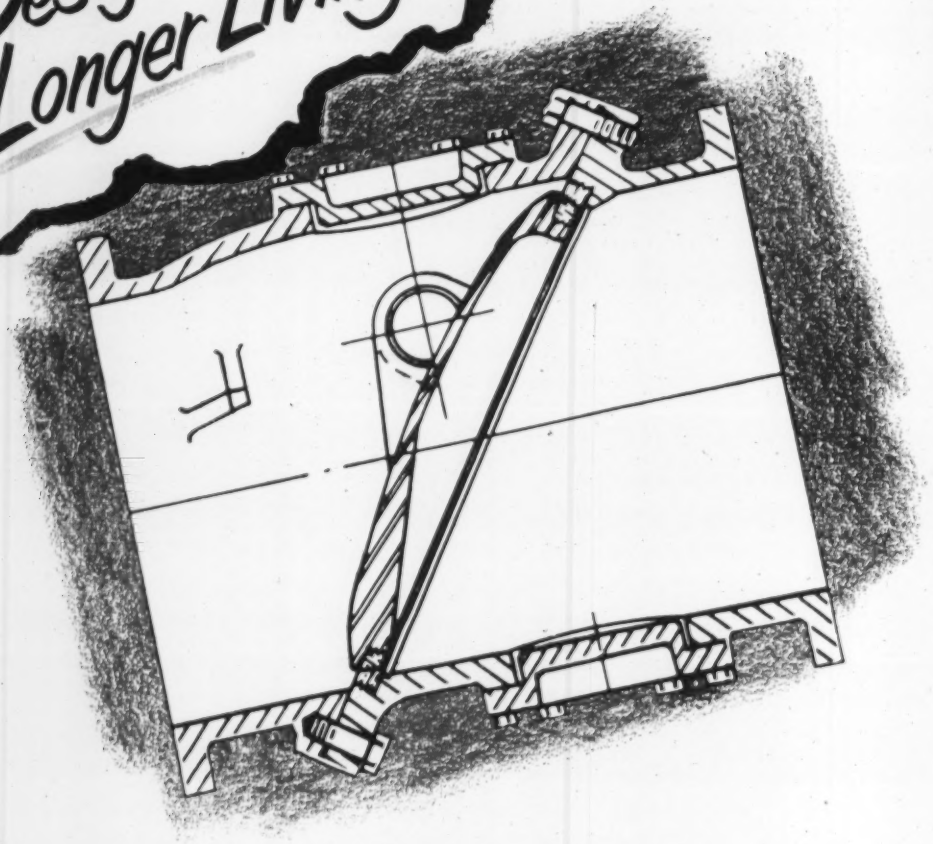
•

A dispute is on between the special atom labor panel and the Conciliation Service that may have to be decided at the White House. The panel, headed by Cyrus Ching, has the job of untangling labor difficulties at atom plants. Most of the disputes have been between contractors and construction trades. The Conciliation Service has been objecting to the Ching group on the grounds that atom disputes should be looked at the same as any other serious labor difficulty.

Ching wants the panel to be even stronger. Under Truman, the panel was separate from the Conciliation Service, but Eisenhower put it at least under housekeeping control of chief conciliator Whitley McCoy. Secretary of Labor Mitchell has been keeping out of the dispute as much as possible, favors a stronger atom panel.

White House staff chief Sherman Adams may make the final decision.

Design for Longer Living



...You find it only in

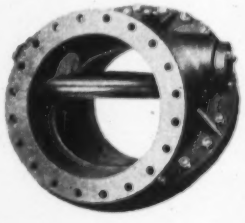
CHAPMAN'S
Tilting Disc CHECK VALVE

Here you can see the specially designed *airfoil section* of the disc in the Chapman Tilting Disc Check Valve . . . and you can see how the disc-seat lifts away from the body seat when opening (and drops into contact when closing) with no *sliding or wearing of the seats.*

Under usual piping arrangements this unique designed disc won't slam . . . just cushions itself to a quiet closing that does not even jar the line.

And this balancing is the reason why Chapman Tilting Disc Check Valves greatly reduce head-loss over standard designed swing-type checks . . . as proven by tests in leading engineering schools and by actual performance in the field.

Available in iron or steel. Complete test data is given in Catalog No. 30–write for your copy now.



The Chapman Valve Mfg. Co.
INDIAN ORCHARD, MASSACHUSETTS

'54 construction outlook takes optimistic turn

Government ups estimates on basis of record put-in-place volume for first five months; contract awards also gain

An all-time high in construction activity for the first five months led government experts this week to the confident prediction that this will be a $36 billion year—a good 2% ahead of last year's record volume of work.

Washington's optimism—expressed in a Department of Commerce study—was echoed by two key groups holding conventions in Boston. One was the Producers Council Inc., an organization of building materials manufacturers; the other was the American Institute of Architects.

Here are the principal factors that have led the federal government to revise its earlier estimate that construction put-in-place this year would dip to $34 billion.

- Private housing starts have been running at an annual rate well above 1.1 million units, instead of less than a million as forecast in November.
- Commercial construction, notably warehouses, office and loft buildings, is up 38% over last year and seems to be heading for a record $2-billion mark or a gain of 22%.
- Private, religious, educational and recreation projects are scoring big gains and are expected to show increases ranging from 11% to 32% over 1953.
- Public construction appears to be heading for a 4% gain, despite a 20% drop forecast for military facilities and a 37% decline in public housing.
- Highway work is expected to amount to $3.7 billion, a gain of 15% over last year. Public school construction is on its way to a $2-billion mark, an increase of 16%. The $1 billion now foreseen for water and sewage projects would be a record as well.

• Open to some question—The record volume of construction put-in-place during the first five months—$13.2 billion for a 1.7% increase over the same period last year—is not too surprising in view of the record volume of heavy construction contract awards reported by ENR in '53. Last year, new all-time highs in dollar value of contracts awarded for state and local and privately owned heavy construction offset a sharp drop in federal awards. And, many of the large projects which helped boost the '53 contract total are showing up in current put-in-place figures.

What is somewhat surprising is that the Commerce Department should predict a banner year, despite the slack in first quarter heavy construction contract awards this year. This slow start could affect the volume of construction put-in-place in the coming months. For, while private housing and commercial building awards have been exceeding expectations, public works awards are still behind last year in all categories except highways which are holding even with '53.

However, municipal bond sales show a big gain so heavy construction contract awards could easily catch up. While awards for the first quarter fell 34% behind a year ago, the decline at the end of the first 24 weeks is now 14%.

• AIA has good news—At the board of directors meeting preceding the opening of the AIA's 86th annual convention earlier this week, eight of the organization's 12 regional directors reported that new work is coming into the offices in their areas at a rate equal or ahead of last year. These reports tend to confirm results of survey made by ENR last December (ENR Jan. 7, p. 21).

In three regions, the Middle Atlantic, Gulf and Western Mountain States, overall activity has increased from 5% to 10% since March of this year and is generally ahead of the same period a year ago. But a falling off in work was reported by the directors of the South Atlantic, Central States and Great Lakes regions, with declines ranging from 5% to 10%.

The picture on new work was particularly spotty in the Northwest and New England areas. As compared to a year ago, Washington State has forged ahead by 10% and Montana by 20%, while in Idaho and Oregon volume has declined about 20%. Similarly in New England, while Vermont and Maine report increases of 20% and 25%, respectively, declines have been noted in Massachusetts, Rhode Island and Connecticut.

According to the AIA regional directors' reports, school design contracts are the top source of new business in all regions. Commercial work is in second place in nine regions. Religious buildings, including parochial schools, is a major type of work in more than half the regions, and in second or third place in several. Residential and industrial work generally ranks third or fourth.

• Industry views—The Producers Council, holding its spring meeting in Boston in conjunction with the AIA convention, held a panel session on Monday with the Department of Commerce figures as basis of discussion. The panel was chairmaned by Miles Colean, consulting economist, and included Walter W. Schneider, representing the Department of Commerce, Construction Statistics Division.

Representing contractors at the panel discussion was William Muirhead, president of the William Muirhead Construction Co., Durham, N. C. and secretary-treasurer of the Associated General Contractors of America. Muirhead held that there was good reason to look forward to volume remaining high but warned that some regions will do better than others as a result of the trend toward de-centralization of industry. He predicted that pending tax law revisions would prove an aid to construction.

R. S. Hammond, vice president and general sales manager of the building products division of Johns-Manville Sales Corp., told his colleagues that building product sales for the first five months of this year has exceeded estimates. He pointed out that sales lagged the first two months but started upward in March with an increasing rate in April and May. He reported that building material sales for May were 10% ahead of April and 4% ahead of May last year. There are no indications of higher prices for the rest of the year, with the exception of cement which may go up as a result of the current strike, Hammond said.

Speaking for materials distributors, Watson Malone, president of Watson Malone & Sons of Philadelphia and vice-president of the National Retail Lumber Dealers Assn., reported that distributors' costs have leveled off. He said that distributors have been maintaining modest inventories and are finding competition tough. Among many reasons for expecting business to continue at a brisk rate, he mentioned: 1. Opening up of home modernization market; 2. prospects that preventive maintainance will be a fertile field, and 3. good outlook for the "do-it-yourself" business.

Congress boosts appropriation bills, authorizes military construction

Senate increases construction funds in House appropriation bills; House passes military program, raises hospital funds

Construction legislation made significant headway through Congress during the last three weeks, the Senate and the House having moved both money bills and authorization measures toward enactment.

Senate action, in general, has followed precedent by increasing amounts allowed in House-written appropriations, while the House restored money to hospital appropriations and passed a $1.2-billion military construction authorization. Among other construction legislation in Congress, private power and the tax revision bill were moving rapidly towards a vote.

Here is a run-down on important construction measures:

INTERIOR APPROPRIATIONS—Senate increased reclamation construction funds from $114 million to $133 million and made available the requested total of $6 million for investigations, nearly $2.5 million of it in the Missouri Basin construction account. The Senate also stepped up the amount for Bonneville Power Administration construction to $26 million from the House-approved $20 million. These increases will be adjusted in conference.

CIVIL FUNCTIONS — Appropriations for flood control and navigation projects of the Corps of Engineers were in conference at the beginning of the week. The Senate added $44 million to the construction amount voted by the House, increasing that item—in round figures—from $279 million to $323 million, about $14 million more than the Administration proposed. Funds for general investigations and surveys also were increased from $2.4 million to $3.5 million.

INDEPENDENT OFFICES—Conferees were still at work early this week on the money bill for the independent agencies. The Senate increased construction funds for the Tennessee Valley Authority to $130 million, $26 million above the House figure, but rejected a move to add money for the proposed Fulton steam plant near Memphis. The Senate also raised the amount for plant and equipment of the Atomic Energy Commission by nearly $34 million to $130 million, which is still $106 million below the budget estimate for fiscal 1955. To the same money bill, the Senate added $35,000 for the Council of Economic Advisers to pay expenses of the small staff that is coordinating public works planning for the White House.

HEALTH APPROPRIATIONS—In passing the labor-health, education and welfare money bill last week, the House restored $10 million of the $25 million cut by the Appropriations Committee from federal grants for hospital construction. This action makes the House figure $60 million, as compared with $75 million in the President's budget request.

MILITARY CONSTRUCTION—By unanimous vote, the House last week passed a bill that would authorize $875 million of new projects and some $400 million of reprogramed construction. The money request for $1.1 billion to finance the military construction program is before the House Appropriations Committee. And a supplemental authorization for $350 million of housing on military posts is being studied by House Armed Services Committee.

TAXES—The big omnibus tax revision bill is ready for Senate debate and vote. It's wide range of provisions have little aimed specifically at construction, but rather is an overhaul of the tax code.

But in one of the most important provisions it is designed to stimulate industrial expansion—the provision permitting faster depreciation of new buildings and facilities. In general, the new provision will permit cost of a new capacity to be two-thirds depreciated in half the life of the unit. The Senate liberalized the provision to permit the new amortization to apply to any construction completed after Dec. 31, 1953, rather than for only that part completed after Dec. 31.

An effort to give the same fast amortization to second-hand buildings, machinery and equipment failed.

HOSPITAL CONSTRUCTION—The Senate Labor Committee last week approved HR 8149 providing for a three-year, $180-million construction program for diagnostic centers and nursing homes for the chronically ill. The bill already has passed the House and is expected to get speedy approval by the Senate.

Legislation calling for federal aid to school construction is still before a Senate Labor Subcommittee and is likely to get favorable action within the next week. However, it will run into trouble on the Senate floor.

RECLAMATION PROJECTS—The billion-dollar Upper Colorado River Basin project is hung up in the House. The Senate, has delayed action until after the House disposes of the measure. But the Senate Interior Committee members stated the bill will move rapidly if it clears the House.

The House Interior Subcommittee has approved the $175-million Fryingpan-Arkansas project in Colorado, and it is now pending before the full committee. This measure is expected to be approved before Congress quits.

The House Interior Committee this week is scheduled to begin hearings on HR 5301, so-called small projects legislation, which would provide for local construction of federally aided projects. It would permit the Secretary of Interior to authorize projects under $5 million with local participation, while those over $5 million would have to be approved by Congress.

PRIVATE POWER—Legislation to let private power develop the Coosa River in Alabama is moving rapidly through Congress. The development, originally approved as an Army Engineers project and now to be de-authorized so that it may be built privately, last week was approved by Senate Public Works Committee. The $100-million project, to be constructed by the Alabama Power Co., is backed by almost the entire Alabama congressional delegation and marks the first major venture calling for exclusively private rather than federal construction. The bill previously had cleared the House.

NIAGARA POWER—A move will be made on the Senate floor to substitute a bill calling for private development of Niagara River power in place of the public development bill reported last week by the Senate Public Works Committee.

The Public Works Committee reported the Case Bill which would clear the way for the Federal Power Commission to issue the development license to New York state. The committee reportedly reached an agreement on the Case Bill. Only after it was found that none of the four bills before the committee could command enough votes to be reported. The committee then compromised in favor of the Case Bill in order to get a bill out of committee.

Enactment of the Case Bill would result in development by the New York State Power Authority since the Federal Power Commission is bound by law to grant preference to public bodies in issuing licenses.

Held by rails

Aluminum exterior formed floor-by-floor, by units slipped into mullion slots

Running like rails up the exterior of a 26-story office building at 112 West 34 St., New York City, aluminum mullions form slots which hold the aluminum spandrel panels and window sash forming the building's exterior. Connected one on top of another with a water-tight expansion joint, the big mullions on 4-ft 6-in. centers are placed floor-by-floor as work progresses, and the sash and spandrel panels are slotted in place as soon as a new floor-height lift of mullions is in place.

The mullions are fastened by gusset plates to the building's structural steel behind the spandrel panels at each floor level. At the back of the extruded mullion—square-faced in section—the sash and spandrel units are fastened by steel clip angles which bolt to a small flange extruded as an integral part of the mullion. The arrangement of clip angles and expansion joints between lengths of mullions allows the whole exterior aluminum skin of the building to expand and contract. Flashing at each floor level is connected to a condensation gutter and a weephole system to carry any possible condensation to the outside of the building.

Warping of the aluminum spandrel panels is prevented by the slightly curved surface which is built into the panel and reinforced across the back of the unit. The ⅛-in.-thick panels curve outward and any expansion, contraction, or "canning" effect only changes degree of panel's convexity.

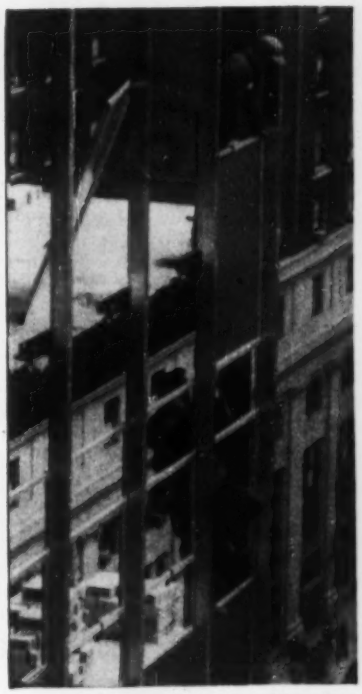
All panels are coated on the back side with a ½-in.-thick inorganic acoustical material. Back up behind the panels consists of 4 in. of concrete block with a 4-in. air space left between panel and back up.

Cost of the aluminum facade, which is assembled by units and erected on a floor-by-floor basis (as opposed to a spandrel-sash-mullion assembly at the factory), comes to less than $4 per sq ft, furnished and installed, with the exception of glass and glazing. Double weatherstripped windows permit cleaning from inside the building.

Above the 23rd floor continuous frame aluminum louvers will be attached to structural steel to conceal the building's water tower.

Architects for the building are Rudolph C. P. Boehler and Rene C. Brugnoni, of New York. The Cupples Products Corp., St. Louis, Mo., fabricated and erected the aluminum facade. Webb & Knapp, New York, is the owner-builder.

MULLIONS in floor-height lengths are fastened by gussets to structural steel.



LIKE RAILS, square-faced mullions form slots to hold spandrel and sash units.

ALL-ALUMINUM EXTERIOR of the 26-story building will cost $4 per sq ft, in place.

Spur to Post Office construction seen in pending lease-purchase legislation

Party politicking on the Senate side of the Capitol has thrown a temporary block into the path of lease-purchase legislation. But Congress is confident that a bill will be agreed upon soon authorizing the General Services Administrator and the Postmaster General to make contracts for what amounts to installment buying of buildings.

Both the House and the Senate have passed separate versions of the lease-purchase bill (ENR April 29, p. 21). The Senate added limitations to the bill that the House approved last summer. Conferees of the two branches discussed the difference at an initial meeting June 4 and were on the verge of agreement when the conference recessed to permit Senate members to sound out opinion of other senators.

There is nothing insurmountable about the differences. The conferees reportedly agreed on a method of resolving the only serious difficulty—a Senate amendment that would require prior clearance by the Public Works Committees of both houses before a lease-purchase agreement could be executed. The Attorney General has ruled the restriction an infringement on the constitutional powers of the President, calling for a veto of the bill if passed by Congress with this provision. The conferees worked out a substitute provision that they think would avoid constitutional trespass and still retain congressional control over commitments of annual rental appropriations to lease-purchase contracts.

On other limitations added by the Senate, the House conferees were willing to concede. But up to last weekend the House members, including the leading sponsor of the bill, Rep. J. Harry McGregor, had not been able to get their Senate counterparts to resume the conference.

• **Passage endangered**—McGregor was discouraged as well as baffled by Senate stalling. He has to leave Washington this week for an extended trip, and there is no one else among the House conferees who can do an equal job of selling the revised bill to the House when the conference report comes up for consideration. With chances rapidly fading for any such action by Wednesday of this week, McGregor feared that the bill might be lost in the shuffle.

Senate limits on the volume of lease-purchase contracts that can be signed in the fiscal year starting July 1 won't restrict activity during the first year of operation. GSA and the Post Office Department told the Senate committee that the limitations wouldn't cause any holdback on contract awards during fiscal 1955.

The Senate imposed ceilings on the total of annual payments that the two agencies could contract for during the year: $4 million for GSA and $1 million for the Post Office. Those annual payment totals would represent about ten times the amount in construction—some $40 million for GSA and $10 million in postal structures.

• **Post Office leasing**—Less latitude is required by the Post Office Department because it intends to make wide use of another provision in the bill. Ormonde A. Kieb, experienced real estate man who heads the department's bureau of facilities as Assistant Postmaster General, told the Senate committee that "the tool we desire most to get is an extension of our leasing authority."

The bill provides for that extension, increasing the maximum period for straight leasing from 20 to 30 years. This section allows the Postmaster General to enter into straight lease agreements for erection by the lessor of such structures as the Post Office Dept. deems appropriate.

Much—if not most—of the new construction for the Post Office Dept. will be done under these lease contracts. And, the new legislation removes many of the obstacles that handicapped lease agreements in the past.

First of all, the legislation will permit the postal people to option or buy sites for needed structures. This action will eliminate the land speculation that goes on now when news leaks out that the Post Office is planning a new structure for a community. The speculation boosts land prices and costs the government money. If the bill becomes law, the department will be able to nail down the best site, design a building to fit it, and then take bids on the designed structure, with the successful bidder buying the land at cost.

At present, the Post Office Dept. cannot put up any earnest money on an option or purchase. It is taking gratis options wherever it can get them, but there are few owners willing to give free options. Railroad companies have cooperated on terminal building sites, as at Seattle and New Orleans, but other owners usually demand money for an option.

If the law permits, as now seems likely, the department probably will follow the same practice that GSA plans to use: That is, get an architect-engineer firm to design a complete building on which construction contractors and financial sponsors for a lease project could bid. That would be a much better way of handling a job, it is thought, than the procedure the department now is compelled to use (ENR April 29, p. 21; May 27, p. 8). Cost of the architect-engineer work would be charged to the successful bidder and paid back.

Longer lease periods (plus probable options for additional five-year extensions) would attract institutional investors like life insurance companies to put money into these buildings for government use. Lease-purchase contracts (most of which would be written for 20 years or longer under the ten to 25-year terms permitted by the bill) would attract some of the same kind of investment capital. GSA and the Post Office would design both kinds of proposals to encourage competition on a basis of both construction costs and investment return.

Present law that limits GSA to five-year leases for all civil functions of the government (except postal services)—and one-year leases in the District of Columbia—runs up the rental cost excessively. And the Post Office is paying through the nose in many places for space on which the original lease has expired.

After the first year, GSA and the Post Office Dept. will be able to make lease-purchase and long-term leasing commitments within the limits of annual rental appropriations. Right now, GSA is paying about $30 million a year for the civil services of the government, and the Post Office Dept. is spending about $27.5 million in rent. If the total of present rentals could be converted into new buildings, the result would be close to $600 million of new construction.

GSA and the Post Office Dept. have given Congress a list of more than 5,000 eligible projects where new facilities are required. GSA has submitted a proposed cost limit. These costs add up to $2.25 billion.

The cost limits are too low in some, too high in others.

For nearly 300 of the projects, sites have been acquired. Those appear to be the projects that could move ahead most readily. The dozen big jobs in the table are among those for which the government already owns the land.

GSA has plans substantially complete for about 100 projects. Fifty of them could be put into construction in 60 to 80 days after a decision is made. Five of those projects total $36 million; the remaining 45, $14 million.

Single federal projects agency asked

NSPE makes Hoover Commission recommendations—denounces pacts on engineer hiring, also unionization

The National Society of Professional Engineers last week urged the Hoover Commission to recommend the integration of federal public works responsibilities in one department and suggested establishment of an independent board of impartial analysis for federal engineering projects.

A strongly worded NSPE statement to the Hoover Commission, charging present federal organization of public works as "most unsatisfactory," was issued during the society's 20th annual convention in Milwaukee.

Pleading for an end to the current "hodgepodge of administrative responsibility for public works activities," the NSPE resolution declared that efforts now being made by the Executive Branch to coordinate federal public works planning were "minor" and constituted "only attempts to relieve a situation admittedly unsound."

The NSPE also told the Hoover Commission that it favored development of the nation's natural resources by private enterprise and that federal engineering services should be limited to administrative and supervisory positions.

• **Employers' pacts denounced**—The convention debated the practice of employers making "gentlemen's agreements" not to hire engineers away from each other and ended by adopting a policy statement terming such pacts among employers as "an infringement of the individual rights and liberties of employes."

The policy statement affirmed "the right of an individual professional engineer to seek other employment without notifying his present employer of his intention to do so." However, the statement declared, "the professional engineer has a responsibility and loyalty to his employer and should tell him if he is looking for another job, provided there are reasonable grounds for believing that the employer will not thereafter discriminate against or otherwise jeopardize the current status of the employe as a result of such notification."

• **Unionization issue**—Strong sentiment against unionization of engineers found expression in a resolution condemning it "as incompatible with standing as professional men." Harry A. Winne, a retired vice-president of General Electric Co., Schenectady, N. Y., declared in one of the session's principal addresses that the engineer who affiliates with a labor union forfeits his right to be regarded as a professional man.

Winne, recipient of the society's 1954 Award for Meritorious Service to the engineering profession, contended that the engineer is really a part of management because he manages methods and materials. Yet, he declared, when he joins an engineers' union, as some engineers have done, he tells the public that he does not wish to be regarded as part of management.

• **Military service problem** – The NSPE adopted a recommendation for a joint military-civilian board to establish policy on recall of specialized industrial personnel for military service. It urged creation of the board to protect industry against being stripped of key men by indiscriminate recall of engineers and technical personnel.

The society also took the position that experience of engineers called back into the service should be evaluated to determine if they, as a result of their training and work, were qualified for more advanced duty than that to which they were assigned when originally called to military service.

• **New officers**—Clarence Shoch of Allentown, Pa., assistant to the president of the Pennsylvania Power & Light Co., and an electrical engineer, was installed as the new NSPE president, succeeding T. Carr Forest Jr., Dallas, Tex. R. B. Allen, professor of civil engineering, University of Maryland, assumed the office of treasurer.

Vice-presidents starting terms were L. F. Frazza, Johns-Manville Co., Hawthorne, N. J., civil engineer; Virgil Gunlock, Chicago Commission of Public Works, civil engineer; M. F. Wooten, Jr., member of Wooten, Wooten & Crosby, Charlotte, N. C., consulting engineers; O. C. Mayer, Idaho Power Co., Boise, Idaho, electrical engineer; and R. J. Rhinehart, Arkansas Power & Light Co., Pine Bluff, Ark., electrical engineer.

County officials urge law revisions that will strengthen their authority

The National Association of County Officials last week re-stated its case for endowing country government with stronger lines of authority, notably in the field of highway construction.

Summing up NACO's prime goals at its 18th annual convention in Omaha, Neb., Donald C. Scribner, one of the organization's newly elected vice-presidents, made these points:

"For many years the tax exemptions of land acquired by the federal government have raised havoc with the counties' fiscal structure. We have long recognized this problem and have been trying to find a remedy for it.

"The association believes that, while federal funds properly should be handled through the state department of public works, the administration of programs involving secondary and rural roads is the direct responsibility of the counties."

Scribner, who is Treasurer of Fulton County, N. Y., also noted the association's interest in the counties' having more definite responsibility in connection with highway safety, civil defense and public welfare.

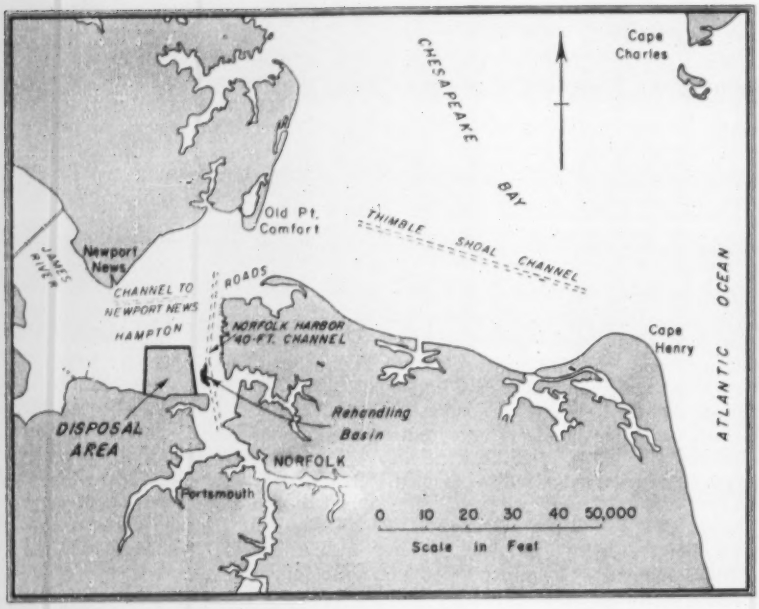
Fred B. Glass, County Judge of Falls County, Tex., was elected president of the association succeeding G. A. Treakle, County Supervisor of Norfolk County, Va., who in turn was named treasurer of the organization.

• **Highway laws**—It isn't just the lack of money, manpower or materials that can retard the construction of rural and county roads. Often the bottleneck lies in outmoded or inadequate laws governing the legal aspects of the work. This was the contention of Louis R. Morony and David R. Levin, chairman and secretary, respectively, of the Highway Research Board's committee on highway laws.

"The time is coming," said Morony, "when all highway programs presented for the consideration of state legislatures will be based on the integrated findings of engineering, fiscal and legal studies. In the past, the legal side has been largely ignored. As a result, unlooked-for obstacles have cropped up in trying to implement the proposed improvements."

In state after state, Morony observed, highway departments have been confronted with legal roadblocks, not only in long-range programs, but in trying to reorganize to perform routine tasks more efficiently.

North Dakota was cited as the only state which has made a real attempt to bring highway laws up to date. Before it did so, Morony noted, the highway department was not even sure it had the power to stop a farmer from doing some planting actually on the right-of-way.



Hampton Roads dredging disposal area will provide 25-year dumping ground

Bids will be opened next week to initiate construction of an enclosed disposal area with a storage capacity of about 100,000,000 cu yd of dredged material adjacent to the harbor channel at Norfolk, Va.

The project, described by Norfolk District Army Engineers, as the first of its kind, is estimated to cost $8 million. The job will be let on a continuing contract, with Oct. 30, 1956, as the tentative completion date. Army Engineers received a $700,000 appropriation for fiscal '54 and $3 million is anticipated for fiscal '55.

The disposal area is necessitated by an acute dredging disposal problem in connection with maintenance of channels and berthing facilities in Hampton Roads. As a result of depletion of dumping grounds along the harbor shore line, all dredged material now must be transported 40 miles to sea. The project is calculated to provide for both government and private dredging disposal for 20 to 25 years.

• **Retaining levees to be built**—The project consists of a trapezoidal area extending about 11,000 ft northerly from the shoreline of Craney Island, on the Portsmouth side of Hampton Roads with widths of 9,000 ft and 11,000 ft, encompassed by a retaining levee. A roadway providing access to the site will be built from the nearest state highway. There will be three sluiceways for sluicing overflow from the disposal area during rehandling operations.

Additional features to be provided later will consist of a rehandling basin, a pipeline trestle and facilities for transferring material from the basin into the disposal area.

The disposal area will be located on Craney Island flats in water depths increasing from the shore outward to a maximum of 14 ft below mean low water. There is a marine clay formation that extends to depths of 100 ft below mean low water at some locations, making for unusually soft foundation conditions.

The retaining levees will be about 30,000 ft long with a crown width of 22 ft and an average base width of 700 ft. Slopes will vary from 1 on 15 for the above water portion to 1 on 30 and greater for the underwater portion.

• **Fill to be placed hydraulically**—Pipeline dredges will place the fill by pumping selected borrow material from offshore deposits. The average pumping distance will be 2½ miles.

The fill will be constructed to a maximum elevation of 5 ft above mean low water which will require a net quantity, without allowance for settlement, of 5,100,000 cu yd of fill material. About 50%, however, has been allowed for consolidation and displacement of the soft underlying material, making a total estimated quantity of hydraulic fill material amounting to 7,700,000 cu yd.

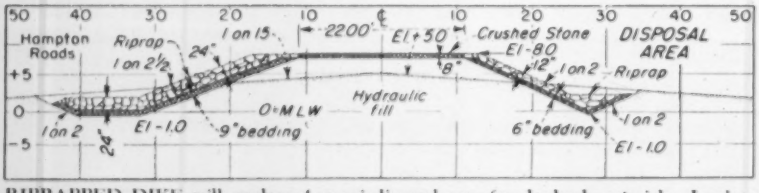
Following completion of the hydraulic filling to 5 ft above mean low water, an additional 3 ft will be added to the height of the levee by land equipment and covered on both sides by stone revetment as a protection against wave action.

The stone revetment will be placed on a 1 on 2½ slope on the outside and on a 1 on 2 slope on the disposal area side with a toe extending to one foot below mean low water in order to prevent undercutting.

The three sluiceways will be built through the west leg of the retaining levees. Each will be 64 ft long by 22 ft wide. They will be of pile and timber construction and treated for exposure to coastal waters. They will be decked to permit use of the roadway along the levee crown.

Final design is not ready for the pipeline trestle and rehandling basin.

Design and construction of the disposal area is under direction of Col. R. B. Warren, district engineer, assisted by Lt. Col. John W. Chesley, Jr., executive officer, Clarence J. Robin, chief engineer, and E. K. Jackson, chief of operation.



RIPRAPPED DIKE will enclose 4-sq mi disposal area for dredged materials. In-place material can be cut no steeper than 1 on 15 above water and 1 on 30 below.

Toll road feasibility study ordered by Arkansas

Despite a negative report made by the University of Arkansas on a projected Little Rock-West Memphis, (Ark.) toll road (ENR Feb. 11, p. 25), Arkansas has retained Brown & Blauvelt, New York engineers, and Wilbur Smith & Associates, traffic engineers of New Haven, Conn., to make a feasibility report on the proposed route.

At the behest of the Arkansas Legislative Council—an interim body studying the program—the State Highway Department ordered the survey of the route which would parallel U. S. Route 70. The toll route was determined the most nearly feasible in the University of Arkansas report, but none of the five toll projects studied had been recommended by that group.

Florida toll road agency orders new traffic study

The Florida Turnpike Authority has engaged the New York firm of Coverdale & Colpitts to make a new traffic and earnings survey of the still-unauthorized two-thirds of the proposed 341-mile Jacksonville-Miami toll highway.

Both feasibility and preliminary engineering surveys on the entire project had been made to the State Road Department in 1952 (ENR Nov. 19, 1953, p. 24).

A new set of engineering plans is reported to be 43% complete on the 103-mile section of the turnpike from Hollywood, just north of Miami, to Ft. Pierce. This project was authorized by the 1953 legislature in a bill limiting the turnpike authority's activities to the southern end of the proposed highway. Steps are now being taken to get a court test of the $87-million bond issue needed to finance this leg of the turnpike.

Along with inaugurating a new traffic study of the Jacksonville-Ft. Pierce section of the proposed toll road, the authority also has voted to engage D. B. Steinman of New York to design and supervise construction of the New River bridge at Fort Lauderdale and the St. Lucie Canal bridge, the two projects to cost an estimated $8 million. The authority revised plans for the New River bridge by reducing the width from 80 to 40 ft for an estimated saving of $2 million.

Columbia River agency examines draft compact

The newly organized Columbia Interstate Commission has given tentative approval to certain non-controversial sections of a proposed draft compact but has left the more knotty problems for later review.

At a recent meeting in Spokane, the 44-member commission indicated agreement on sections authorizing it to study and recommend solutions to pollution control problems; recognizing the rights of Indians and the federal government on the Columbia River and tributaries; and permitting the compact to take effect after four states and Congress ratify it. The states are Washington, Oregon, Idaho and Montana.

Left unsettled was the problem of voting power for member states—although most agreed the federal government should have no vote. Also set aside until later were decisions on allocating power and on financing the permanent compact commission.

Frank A. Banks of Coulee Dam, Wash., who was re-elected chairman, expressed hope the final draft could be worked out by fall and presented to state legislatures for action next winter. Banks, in a discussion of water consumption rights, acknowledged that the compact "may alter the U. S. Supreme Court ruling on relative water uses." But, he declared, "I believe that the states can alter the ruling legally."

New "CM&E" editor

H. T. Perez named to head Construction Methods and Equipment staff

Henry T. Perez, for the last three years Senior Associate Editor of Construction Methods and Equipment, and previously a member of the staff of ENGINEERING NEWS-RECORD, has been named editor of CM&E.

Mr. Perez succeeds the late Harold W. Richardson (ENR May 20, p. 23) as chief editor of the monthly publication.

A graduate of Cooper Union School of Engineering in New York, Mr. Perez was associated with Spencer, White & Prentis, Merritt-Chapman & Scott, and the Alabama Dry Dock & Shipbuilding Corporation; and served as a Naval officer during World War II, before joining the McGraw-Hill Publishing Co. as an assistant editor on CM&E in 1946.

After joining the magazine staff and being based in New York City, he served as field editor of Chicago for both ENGINEERING NEWS-RECORD and Construction Methods and Equipment, returning to New York in 1950 to become managing editor of CM&E.

Closely associated with Mr. Richardson and with the two national construction magazines for eight years, Mr. Perez is well known in the field of engineering construction, and brings to his new post a wide acquaintance with the men in the industry, and a broad knowledge of the materials, methods and equipment used.

Elyria officials stand pat—still blocking Ohio turnpike

Since August 1953, the little city of Elyria, Ohio, has thrown barrier after barrier in the path (within its borders) of roadbuilders of the Ohio Turnpike Commission.

At that time Mayor Henry W. Ault proclaimed that officials of the city would erect a legal roadblock "to the dictatorial efforts of the commission—a super bureau, operating under the delusion that it is the law unto itself." (ENR Sept. 3, 1953, p. 25).

The city, up to now, has made good its boast. Elyria successfully has enjoined the state authority from proceeding through the town with its east-west highway while the tide of the dispute has ebbed and flowed around court charges and countercharges.

The problem is as far from solution now as it was then, with the city demanding realignment of route to eliminate bisection of the city, with reasonable consideration for future expansion. The commission maintains that it has right of eminent domain—even where city property is affected—and that it intends to use the route selected.

Meanwhile, undisputed sections of the 241-mi highway are scenes of bustling activity that will account for expenditure of about $1 million per mile by the time the turnpike is opened to traffic.

ASCE dues raise passes

Members of the American Society of Civil Engineers, on the third such ballot in recent years, has voted a constitutional amendment to raise the society's dues. Twice before, the amendment failed to pass. This time, with 16,538 of ASCE's more than 37,000 members voting, there were 12,035 ayes, 73% of the vote. Two-thirds of the vote was required for passage.

To members outside District 1, the New York Metropolitan Section, the amendment means $15 per year dues for junior members and $25 per year for associate members and members, instead of the form $10 and $20. To members within the Metropolitan Section, the amendment means no change in dues; they already have been paying the $15 and $25 rates.

Jobs in the news

BANK-CONTRACT for a $16-million, 24-story office building in Houston, Tex., has been awarded to the W. S. Bellows Construction Co., Houston. The Second National Bank, Houston, is the owner.

BRIDGE—A $5-million contract for construction of the Maumee River Bridge, on the Toledo Expressway, has been awarded to the McDowell Co., Inc., Cleveland, Ohio, by the Ohio State Highway Department, Columbus.

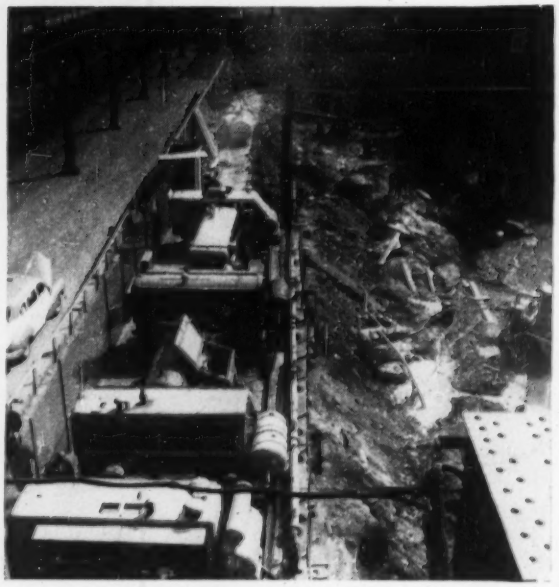
SCHOOL OF MEDICINE—Superstructure for the Albert Einstein School of Medicine and foundations for auditorium, library, and power house at Yeshiva University, New York City, will be built by Caldwell Wingate Co., New York. Cost of the project is estimated at $7 million. Kelly & Gruzen, New York, are architects.

ARMS PACKED AWAY

One of the very few structures that will be needed for Army Ordnance storage of machine tools is this $1.4-million controlled humidity warehouse at Livonia, Mich. Tools used in production of tanks will be stored here against future need. Only other similar structure planned will be a $1.8-million warehouse to be built at Grand Rapids, Mich., for storage of tools used in production of tank transmissions. All other government owned machine tools are to be stored in existing government owned plants, or in centralized depots such as that at Fort Custer, Mich., where 96 buildings were taken over recently for storage.

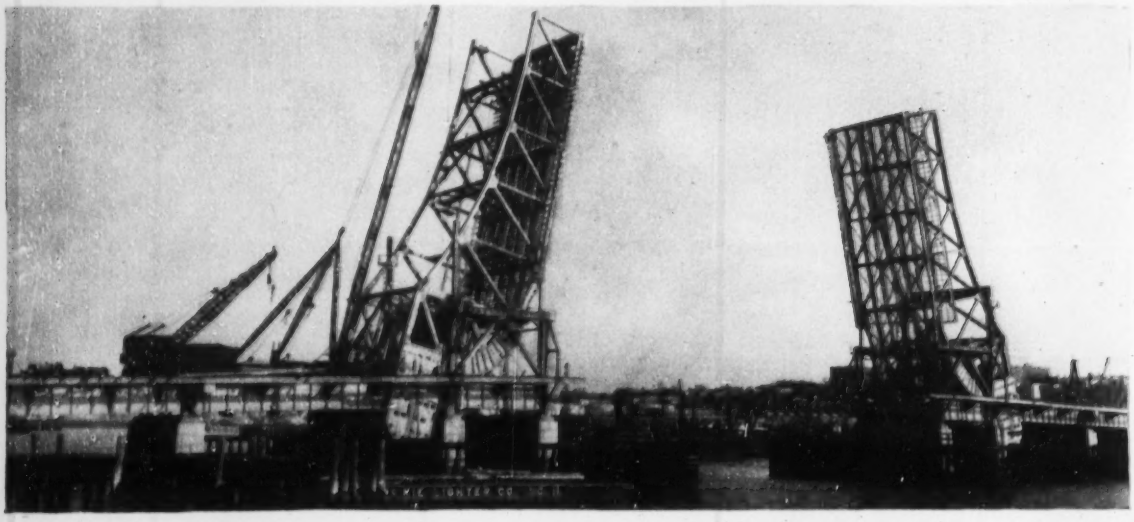
ROCK COMING OUT

This array of compressors, in midtown New York sends out a combined volume of 2,800 cfm to dozens of air-powered tools that are cutting out foundations for the 42-story Socony-Vacuum building, occupying an entire block off East 42d Street. The machines will cut away most of the 57,000 cu yd of shovel rock that must be removed. The compressors feed sections of flanged-end 6-in. header pipe in the steel wale atop soldier piles, to permit air to be taken off at dozens of spots without moving the compresssors. Turner Construction Co. is general contractor; Slattery Contracting Corp. is doing excavation, foundation and ground slab

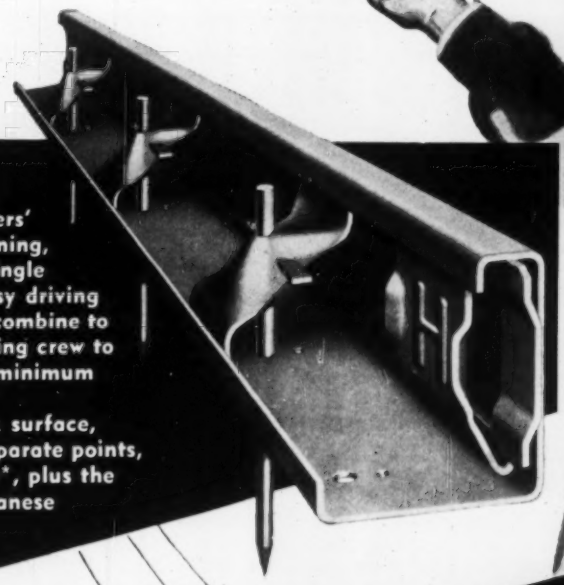


BRIDGE GOING UP

Because of heavy traffic on the Chelsea River, Mass., steel erection on this twin bascule bridge is being carried on with the leaves in "up" position. While American Bridge Co.—prime contractor on this job—puts everything possible in place while the bridge is open. Coleman Bros. Corp., of Boston, subcontractor, will pour counterweight concrete and do other work. The bridge is 225 ft, center to center of bearings, 1,038 ft from face to face of backwalls. It will carry a 40-ft roadway and two pedestrian walkways.



HELTZEL FORMS are real FORMSETTERS' FORMS

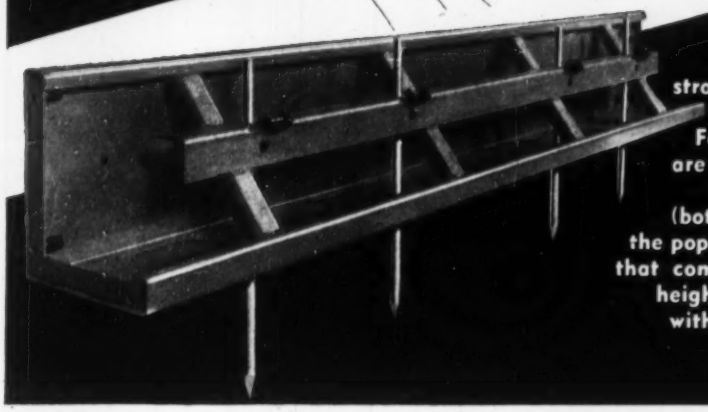


Yes, Heltzel Forms are truly "Formsetters' Forms". Quick aligning, fast, sure locking, single wedging . . . and easy driving rerolled rail stakes combine to permit the formsetting crew to do the best job in a minimum of time.

And, the wide track surface, supported at five separate points, the upturned flange*, plus the tough carbon-manganese steel give contractors the strongest, most serviceable form available anywhere.

Forms illustrated on this page are (top) the Heltzel Standard Road and Airport Form, and (bottom) one of several styles of the popular Heltzel Dual-Duty Form that combines two standard paving heights in a single form, with or without dowel installing feature.

*Also available without flange.



Write today for your copy of the fully illustrated booklet STEEL FORMS BY HELTZEL. Send inquiries to Heltzel Forms, Thomas Road, Warren, Ohio.

HELTZEL

STEEL FORMS

THE HELTZEL STEEL FORM AND IRON COMPANY
6400 THOMAS ROAD • WARREN, OHIO

TARGET FOR 1954—Suffern interchange will be eastern terminus of Buffalo-New York toll road until Nyack-Tarrytown bridge over Hudson River is ready in 1955. In this view northward toward Ramapo gap, New York Thruway squeezes past Suffern at lower right; Route 17 connection is at lower left. Relocated Ramapo River is at right of interchange toll plaza.

Thruway pushes onward to New York City

Next week first toll collections will begin for the New York State Thruway, on a 115-mile section between Rochester and Utica—in the central portion of the northern leg of the Thruway, which extends from Buffalo to Albany.

But even as this important event is being celebrated, construction continues at a high tempo along the remaining portions of the 427-mile expressway that will join Buffalo with New York City.

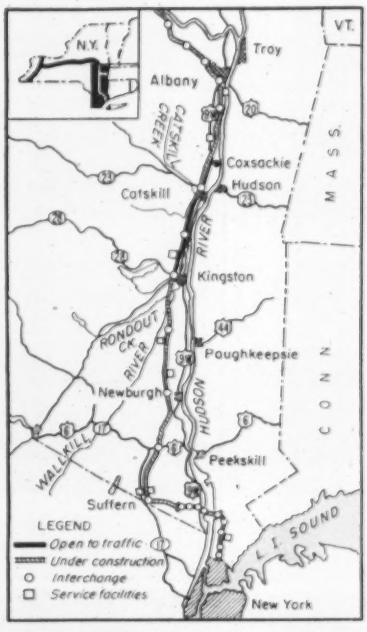
Particularly is this true along the north-south leg from Albany to Suffern (see map), where all work is expected to be completed by the end of this year. A trip below Albany reveals contractors attacking a large diversity of problems successfully and with ingenuity. The results of a similar survey of the northern leg from Buffalo to Albany were published a year ago (ENR July 16, 1953, p. 51).

• **Suffern is hot spot**—There are a number of key sites all along the Thruway where work is being pushed with exceptional vigor. Examples include bridges across the Genesee and Mohawk rivers, and the Hudson River bridge at Nyack. The former will permit toll operation from Buffalo to Albany later this year; the latter—by far the largest structure along the entire route—controls the date when the Thruway can enter New York City (probably mid-1955).

But right now, Suffern is the hottest construction spot below Albany. One contractor is blasting the broad roadway literally in the citizens' back yards. Another is driving piles for a viaduct over the Erie Railroad yards, while a third contractor is working 12-hour shifts preparing the Ramapo River bottomlands for one of the Thruway's most important interchanges.

A glance at the map will show why the Thruway Authority is so anxious to get this Suffern interchange into paving operation:

Route 17 in both New Jersey and New York is the main line for New Yorkers bound for the resort-teeming Catskill Mountains. It also carries heavy truck traffic. Some of America's most notorious weekend traffic jams occur regularly on this road, so thousands of motorists will be glad to pay for relief—even if it's only as far as Harriman. Many will go farther, because the Thruway, being the only



ALBANY-NEW YORK section of Thruway goes south along the Hudson, swinging inland at Newburgh so it can go through Ramapo gap at Suffern.

TICKLISH ROCKWORK—Where Thruway passes Suffern a heavy sidehill cut is being made in the residents' back yards. Millisecond delay blasting eliminates mishaps.

consistently good road up the Hudson's west shore, will act like an interceptor for traffic flowing out of the mountains.

Even though the importance of the Suffern interchange will wane somewhat next year when the Hudson River bridge opens up the last link from New York, Suffern will continue to be a focal point for lots of traffic. It is at the only water-level break in a mountainous region extending southward along the Hudson River from a point below Newburgh. Thus it was a matter of simple roadbuilding economics to keep the Thruway west of the hills, as far south as the Ramapo River gap.

Nevertheless, getting the Thruway's required long curves and easy grades through the gap probably is the most difficult piece of road location below Albany.

• **Meeting earthwork problems**—On the Albany-Suffern leg, a construction account divides conveniently into discussions of earthwork, rockwork and bridges. And earthwork can come first because there is a troublesome soil condition right at the Albany city line almost within normal haul distance of the state soils laboratory (which has given advice to the Thruway Authority on soil conditions ever since the Thruway project began).

Clay soil goes as deep as 150 ft in this section of the Thruway, which is under contract to D. A. Collins Co., Mechanicville, N. Y., so there is a question of stability under fills. Moreover, when taken from cuts, the clay is unsuitable for fill. Both of those disadvantages have been resolved, however, by wasting unsuitable cut material at the margins of fills, where it acts as a counterweight to keep the undisturbed clay under the fills from moving laterally. The material is shaped into flat-sloped, broad berms that range in width from 60 to 120 ft.

An idea of the size and weight of fills is given by a description of the Thruway cross-section (ENR July 2, 1953, p. 38). Minimum top-of-fill width is about 120 ft; earth side-slopes are 1 on 2.

The New York State soils lab men are pleased with the counterweight idea, saying that it not only is a convenient way to make use of unsuitable material, but it also eliminates expensive stabilization measures, such as sand drains.

• **Other stabilization methods**—However, there are a few sand-drain installations: At Rondout Creek, in rugged upland southwest of Kingston, where Corbetta Const. Co., New York, and John Arborio, Poughkeepsie, have a 10.2-mi contract. Corbetta is doing the structures and Arborio the grading and paving.

Sand drains are used on this job to stabilize clay under high embankments and to eliminate post-construction settlements at the south bank of Rondout Creek and in a swamp area ¼ mi south of Wallkill River. At Rondout, where the roadway enters a cut south of the stream, the material that is being sand-drained is a wet, varved silty clay. When disturbed in this natural wet condition it breaks down. The only way Arborio could excavate this material was to use a dragline on mats.

The adjacent approach fill to Rondout Creek Bridge is being placed to a maximum height of 55 ft, over about 30 ft of the sand-drained unstable material. Side slopes are being counterweighted with unsuitable material, and the riverside toe of the fill is to be kept from sliding by a row of rockfilled sheetpile cells.

• **Rock, and pile driving**—The unstable pockets at the two streams are not the only sore spots along the Corbetta-Arborio roadway. The geology of the region consists of rock ridges running in the direction of the Thruway. The ridge tops are only partly exposed, the valleys between them being filled with glacial material and earlier deposits. Much of the new highway rides on this earth.

During the spring this location makes wet going for heavy equipment. There are a few deposits of muck that are being replaced with good material, but for the most part the earth is expected to support the highway adequately.

When it comes to concentrated loads, however, it is a different story. Piles—deep ones—are being driven to support crossroad bridges. At one overpass site between Rondout and Walkill a Raymond Concrete Pile Co. rig had to drive composite pipe and concrete piles 180 ft to bed rock. Although the roadway was dry underfoot, the crawler-mounted piledriver had to work on mats. Jim Lyttle, superintendent for Corbetta, said that the sheeted pit in which piles were being driven had settled a foot. The earth is a fine sand and silt.

Below the Corbetta-Arborio contract, earth conditions are good, except for short stretches of muck.

Arborio, who holds the next contract south of his joint venture with Corbetta (16.5 mi), took care of one piece 1,000 ft long, west of Newburgh. Here he removed the top 3 ft of a peat deposit 10 ft to 25 ft deep, then placed 13 ft of embankment and

(*Continued on page 32*)

COUNTERWEIGHT BERM—Broad spoil embankment in outskirts of Albany opposes lateral-movement tendency of deep clay deposit under high road fill load.

10 ft of surcharge. The fill progressed across the swamp at full height, its forward end being kept in the shape of a ship's prow. The resulting mud wave was dug and cast to both sides. Surcharge was left in place six months before removal for paving this season.

A couple of miles farther south, on a 14.3-mi contract held by Walsh Const. Co., New York, and C. J. Langenfelder & Son, Inc., Baltimore, a thinner and somewhat shorter piece of muck was removed and filled to grade. The last major piece of work of this sort occurred near Harriman, on the 15-mi joint venture of Mt. Vernon Contracting Co. (Mt. Vernon, N. Y.), S. A. Healy Co. (White Plains, N. Y.), and M. A. Gammino Co. (Providence, R. I.). This is a 10-ft surcharge job. An elevating loader was later used to remove the surcharge material.

About the only other soil problem on this contract is a 10,000-cu yd pocket of incinerator waste in the Suffern interchange area. This pocket will be removed and replaced with good material—part of an 800,000-cu yd borrow operation to raise the interchange grade. The real problems here are with rock excavation. Out of 5,000,000 cu yd of excavation in the upper 13 mi of the Mt. Vernon-Healy-Gammino work, 2,000,000 cu yd is rock.

• **Rockwork review**—There are four principal rock-cut stretches between Albany and Suffern: 1. From a point west of Coxsackie to a point southwest of Catskill (Savin Construction Co., East Hartford, Conn.); 2. On a contract of A. E. Ottaviano, Croton, N. Y., west and southwest of Kingston; 3. The Mt. Vernon-Healy-Gammino work; and 4. A short but deep piece of cut that squeezes the Thruway past Suffern, just east of the Suffern interchange. L. G. De Felice & Son, Inc., North Haven, Conn., is the contractor for the last-named.

The northernmost job, by Savin, includes 3,000,000 cu yd of rock excavation. Most of this occurs in the lower 13 mi of the project's 20.3 mi, after the route leaves flat country and penetrates the Catskill foothills. Establishment of a ruling 3% grade makes the location difficult and expensive. All kinds of rock-drilling equipment are at work in this stretch, large and deep cuts being made with the help of big-hole rigs of both percussion and roller-bit types. Millisecond delay blasting is used here as elsewhere.

Flint stops roller bits—On the Ottaviano contract, George M. Brewster & Son, Inc., Bogota, N. J., is subcontracting the earthwork.

The biggest headache for Glen E. Walker, the superintendent, is a flinty limestone. He tried big roller-bit drilling rigs, but the rock was too hard on them. A 6-in. roller bit costing $136 would wear out in 60 ft, so it was necessary to go to percussion drilling with smaller holes. Wagon drills are doing most of the work, although there is one mobile unit similar to that used on the West Virginia Turnpike (ENR Mar. 25, 1954, p. 32). Two hydraulic booms with power feeds and drifters are on the front of a large tractor; a 630-cfm compressor run by tractor's engine rides on the rear.

Arborio is using a similar mobile drilling unit. An added feature, not required in West Virginia, is a dust collector, with its steel box mounted on a frame atop the tractor.

Near Harriman, where the Mt. Vernon-Healy-Gammino contract is located, the heavy rock cuts start again—the beginning of the Ramapo gap. Already occupying the gap are the Ramapo River, Route 17 and the Erie Railroad. Of the three, the railroad is least tortuous, but even it has curvatures greater than the Thruway's minimum (2,800-ft radius). And the railroad already has the most economical long-curve location in the gap.

This means that the Thruway location must go higher, cutting through rock promontories and across gullies.

Some location economy is gained by keeping the three-lane, one-way grade on the uphill side 5 ft above the downhill one. There is a 50-ft mall throughout most of the job, and sight distance requirements are as stringent as those for curvature. Two rock cuts at Tuxedo total 700,000 cu yd. One of them is 90 ft deep, the adjacent fill is 70 ft high. A few miles farther south there is a knob 130 ft above grade that will have to be cut down.

• **Central compressor plant**—Because of the great rock volume concentrated in a short distance, the contractor has set up an electric-powered central compressor plant and runs a 6-in. air service pipe along the top of the uphill cut slope. Most of this drilling is by wagon drills, which hook up to the service pipe wherever feasible.

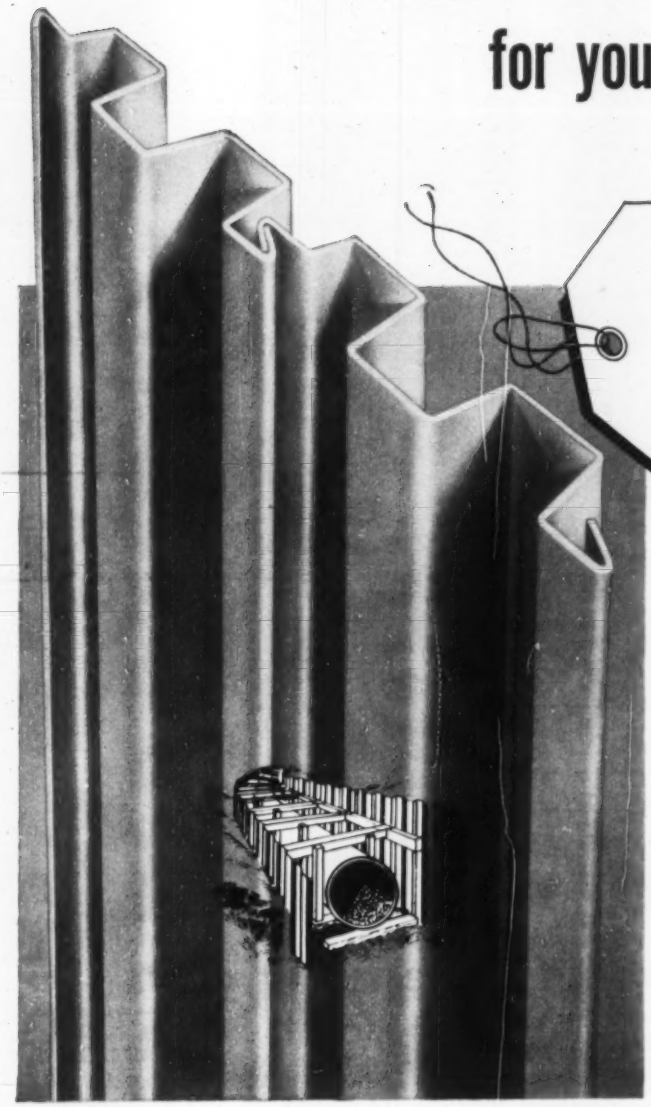
The short distance covered by the two cuts also makes for convenient electric transmission, so the contractor is able to use two large 6-yd electric shovels. Healy had used these on nearby Merriman and Neversink dams; for the New York water supply (ENR Jan. 6, 1949, p. 60).

These shovels load into 25-yd bottom-dump wagons and 15-yd end-dump trucks, carrying the rock to fill or spoil. In fill, the material is placed in two-foot layers, oversize being drilled and blasted on the fill before final spreading. (On the West Virginia Turnpike a headache ball was used for this operation; this was tried at Tuxedo, but the rock was too hard.)

• **For fishermen**—A sidelight on the rockwork came about because local conservationists protested that the Ramapo River relocation would destroy good fishing holes, with boulders on the bottom, where trout like to hide. According to Charles MacDonald, resident engineer for supervising engineers Clarke and Rapuano of New York, Mt. Vernon-Healy-Gammino

(*Continued on page 35*)

the **new** economical sheeting for your excavations



H-S HIGH-STRENGTH
LIGHT-WEIGHT PILING

Foster H-S (High Strength) Lightweight Piling, in 8 and 10 gauge sections, offers the greatest strength pound-for-pound and gauge-for-gauge of any lightweight piling. It gains exceptionally high section modulus from its "High Strength" box-type corrugations, an exclusive L. B. Foster design. You will gain real job economies by using this new low-cost H-S Lightweight Piling . . . it can be handled by hand, can be driven with small hammers, and it requires less bracing. Unlike wood, you can use this High Strength Lightweight Piling in a variety of applications *and re-use it indefinitely*, and at a great savings in cost and labor.

Rent or Buy

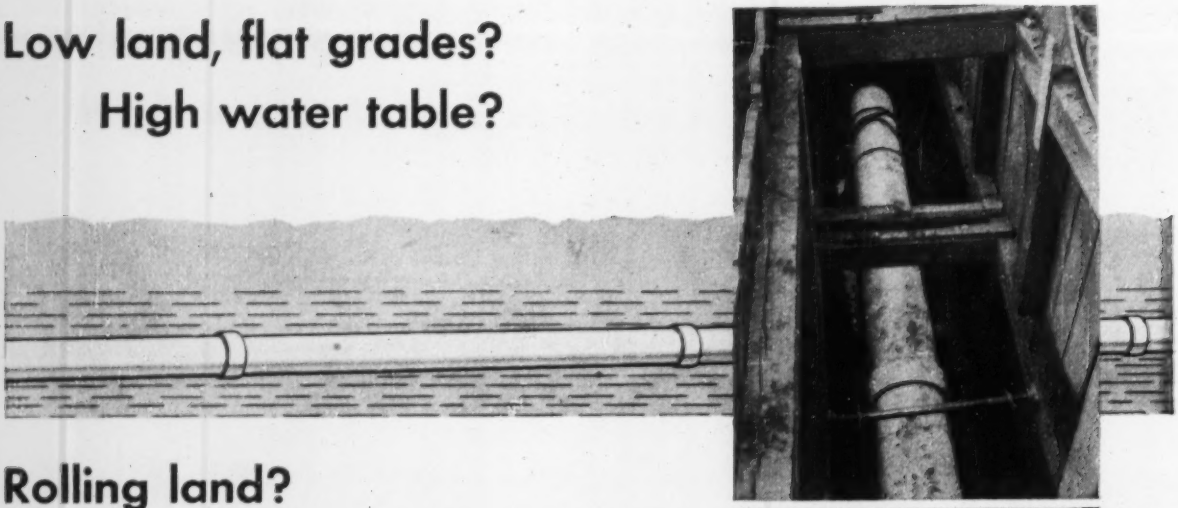
Send for our descriptive bulletin with drawings of available sections. You'll see how our new design Interlock gives a water-tight wall, permits simple folding together of two sheets without having to slide one into the other the entire length. Additional economies — more reason to write today for our Bulletin EP-6.

Buy your basic needs in Foster H-S Lightweight Piling and fill in for special jobs by using our low cost RENTAL plan. Immediate deliveries of exact sections and lengths your job needs, whether you buy or rent. Standard heavy duty, interlocking steel-sheet piling also available from the L. B. Foster warehouse or field stocks nearest you.

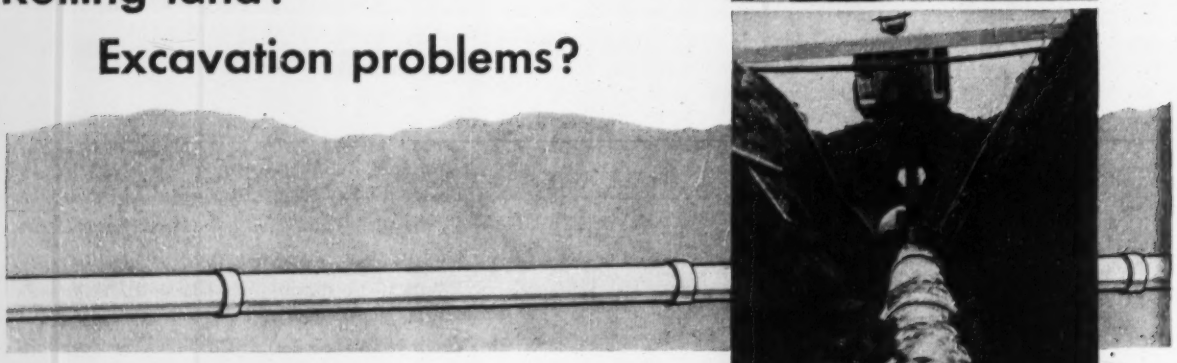
L. B. FOSTER CO.

PITTSBURGH 30, PA. • NEW YORK 7, N. Y. • CHICAGO 4, ILL.
HOUSTON 2, TEXAS • LOS ANGELES 5, CAL.

Low land, flat grades?
High water table?



Rolling land?
Excavation problems?



Whatever the problem—

Transite® Sewer Pipe

speeds installation, cuts operating costs

In a wide range of conditions, Transite Sewer Pipe and its Ring-Tite Coupling provide installation and operational *plus-advantages* that add up to important cost savings.

[Flow Coefficient n–0.010] For instance, with Transite Sewer Pipe, specified velocity of flow can be attained at a minimum grade. Initial savings may also be reflected in smaller pipe sizes. Its unusually low flow coefficient (n = 0.010 derived from the Manning formula) makes this possible. This means less cubic yards of excavation, and may also mean . . . elimination of pumping . . . location of treatment plant at higher elevation . . . lower installation costs especially if in wet or ground-water conditions.

[Tight Joints] Where ground water conditions exist (due to a constant water table or during seasonal rains) Transite's Ring-Tite Couplings are *tight* . . . thus treatment-plant dollars are spent to treat *normal* sewage only, not excessive and unnecessary infiltration.

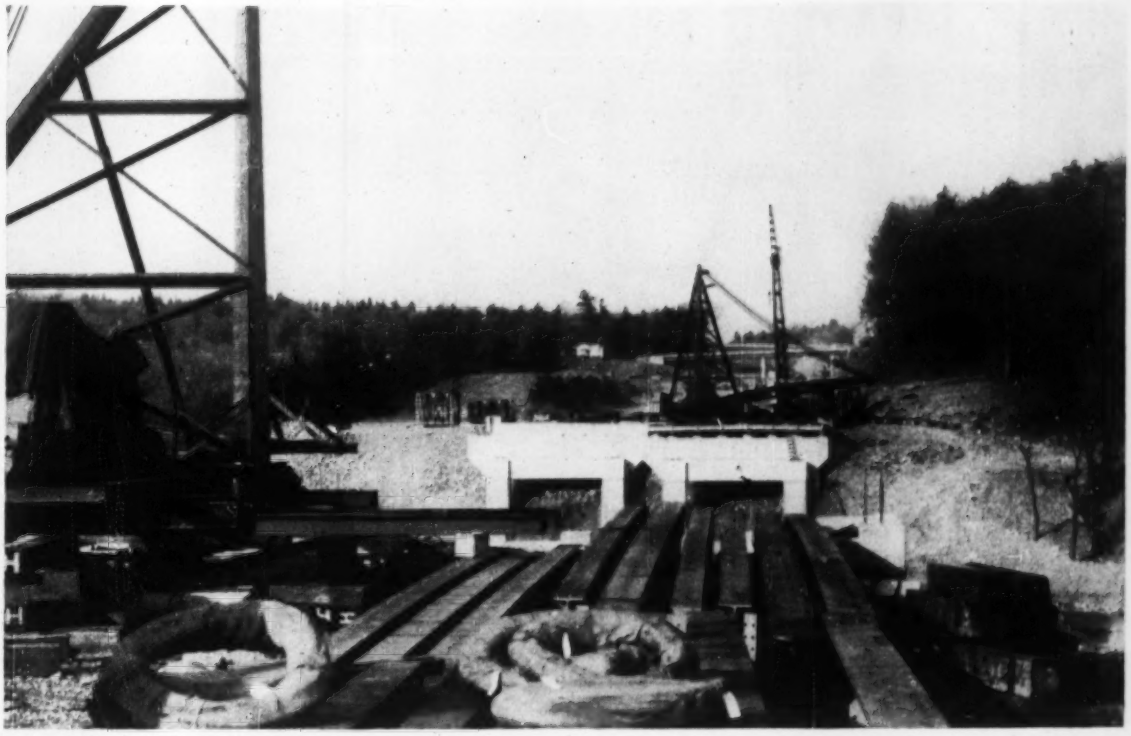
[Strength] Made of asbestos and cement, Transite Sewer Pipe is strong and durable. It withstands heavy load stresses, eliminates expensive cradling in many cases. It is available in two strength classifications.

Transite Sewer Pipe is easily handled, quickly assembled and lowered into trench where it adjusts more accurately to line and grade. The Ring-Tite Couplings are easily and quickly pulled, forming tight, flexible joints that *start* tight and *stay* tight.

For your copy of TR-94A, the helpful widely used Sewer Design Flow Chart, based on the Manning formula, write Johns-Manville, Box 60, New York 16, N. Y.

Johns-Manville TRANSITE SEWER PIPE

THE PIPE WITH THE TIGHT JOINTS



CATSKILL BRIDGE—Two derricks begin erection of three-span continuous deck trusses that will carry Thruway across chasm of Catskill Creek. Note grade-separation structures in background.

saved the day by clamshelling new holes—and dumping in large rocks from the cut excavation.

Prevention of the fallen-rock nuisance also is a feature of this contract. Two-man crews scale the loose rock from the sides of high rock cuts. The men have safety belts attached to wire ropes hanging down the rock face. They send showers of small and large stones to the rough road grade below. Scaling rock faces is a contract requirement that will save the Thruway Authority a lot of headaches—fallen-rock removal costs, as well as hazards to the motorists.

According to Mr. MacDonald, "when we proposed this requirement to the Thruway Authority, Mr. Tallamy (Chairman of the authority) said, 'Fine; we don't want to have to put up any signs warning about fallen-rock zones.'"

• **Water supply threatened**—Another kind of slope protection has little to do with rockwork, but it is near the last big rock cut to be covered in this story. At Suffern, where the Ramapo has been moved eastward to make room for the big interchange, residents last November feared impairment of their water supply. The shift was bringing the stream too close to an artesian well field, so there was a chance that the ground water would be intercepted, or at least polluted.

In order to avoid the construction delay of a lawsuit to determine the merits of the case, the Thruway Authority agreed to seal the stream from the ground water stratum, probably by paving the relocated channel next to the wells. The channel-improvement method was under consideration throughout the winter, and now work is beginning on sealing bottom and side slopes for about 1,000 ft with a bagged-concrete riprap. This type of riprap has been used elsewhere in New York, notably at Corning (ENR Nov. 15, 1951, p. 32).

• **Tight squeeze**—All of the work at the Ramapo gap affects one kind or another of existing facilities, but the tightest squeeze is at the north edge of Suffern. Here, the Thruway comes out of its swing eastward to the Nyack-Tarrytown Bridge. And here, Suffern is built up tight against the steep mountain's toe. A way had to be blasted through that toe with little disturbance to the structures.

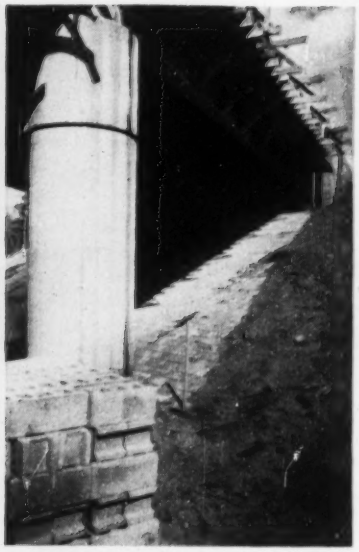
Aside from a mishap or two (one dislodged rock rolled into a man's kitchen), L. G. DeFelice, the contractor, has done a fine job of keeping down the nuisance.

Millisecond-delay blasting seems to be the answer. It minimizes flying rock and "rolls" the loosened material in the desired direction—in this case upslope away from the houses. DeFelice cuts the rock in two passes. The first pass is about 60 ft wide, or half the roadway width—the upslope half. After the first blast has been mucked he blasts for the second pass, rolling the rock toward the mucked-out area, away from the houses. About 100 holes spaced on 6-ft centers are shot at one time. Each hole averages 24 ft deep, with 12 ft of sand stemming on top. More than 1,000 lb of explosive is in the charge. There are nine delays. The shorter delays (8-25 milliseconds) are placed to break first so that the longer delayed charges (up to 200 milliseconds) will move the rock toward the already-broken material.

• **Thruway bridges**—A small amount of the Suffern rock cut extends to an adjacent contract held by Klevens Co., New York. This contract is concerned primarily with construction of a pile-supported viaduct over the Erie yards at Suffern. This bridge is one of several major and minor structures in the Suffern vicinity. None of these, however, compares with three bridges in the upper portion of the Albany-Suffern route. Each is a pair of three-span continuous deck trusses with curved lower chords. Each truss will carry two lanes of traffic. The first bridge has a 240-ft main span. It crosses Normanskill Creek ravine just south of Albany, paralleling an exist-

(*Continued on page 36*)

TRUCK-MIXED CONCRETE is unusual on New York bridges, but a few contractors have permission to use it—under rigid controls. This is bridge across Wallkill River.



STONE SUBSTITUTE—Where quarries are distant, concrete blocks pave slopes.

ing bridge on U.S. 9W. Steel erection was complete this spring. The contractor is Munroe-Langstroth, Inc., Norwood, Mass.

At the same time, erection was just beginning on the second bridge, a 300-ft main span crossing of Catskill Creek, in Savin's contract west of Catskill. This bridge and a similar one on Kaaterskill, a Catskill tributary a mile south, are being erected by Harris Structural Steel Co., New York. At the Catskill Creek site this spring erection derricks were working out from both sides. At the other site, piers had been built but erection had not begun.

Farther down the line are Corbetta's Rondout Creek and Wallkill River crossings. The Rondout Creek foundation job was one of the most active spots on the Thruway last winter, because it had to be ready for steel (beam spans 117-153-153-117 ft long) this spring in order to keep abreast of construction schedules. Most of the concrete was placed in January, when the temperature went as low as zero during nights after big pours. Gas heat under tarpaulins kept the concrete from freezing, however, and Corbetta was able to move on to the 3-span 356-ft Wallkill job in February.

In discussing the extra costs of winter construction, Mr. Lyttle pointed out that there is more to it than tarps and salamanders. For instance, cofferdams must be kept pumped out while concrete is curing; otherwise the cold water will delay the concrete's gain in strength—and therefore the job progress. In the summertime, pumping can be stopped and the water will aid curing.

• **Truck mix okayed**—Another hurdle in the Corbetta work was getting permission to use truck-mixed concrete. The New York State Department of Public Works, which handles a large amount of the Thruway engineering, takes a dim view of truck mixing, maintaining that quality control is difficult. Moreover, the local unions had been accustomed to working with on-the-job mixing plants. Union objections disappeared when the state gave its approval of the truck mixers.

The appeal for approval had been made to E. W. Wendell, state bridge engineer, by Roger Corbetta. Mr. Corbetta is chairman of the New York (City) Concrete Industry Board, one of whose objectives is elimination of abuses in the truck-mixed concrete field (ENR Mar. 11, 1954, p. 21). Mr. Wendell is reported to have told Mr. Corbetta that if anyone could get good concrete out of a truck mixer he (Mr. Corbetta) should be the one.

One important restriction was placed on the trucks' use: Mixing water could not be added until the truck reached the job—where an inspector could supervise the operation. The size of the load and the mixing time also are controlled.

According to Edgar Shrope, Thruway Authority engineer, truck mixing has been approved on a few other jobs in the route's 427 mi.

Other items noted at bridges include the use of spiral steel shear-connectors welded to the top flanges of the longer I-beams. Where stone is not readily available for paving slopes under approach spans cinder blocks are laid.

Some of the bridges are fairly long. In Ramapo gap one structure is 800 ft long, crossing Route 17, the main line and a spur of the Erie, and Ramapo River itself, on seven composite I-beam spans with a maximum length of 124 ft. Farther down, where the Thruway crosses Ramapo River at Suffern interchange, the rare plate girder is found. The maximum single span length in this 4-span river crossing, 130 ft, is only somewhat greater than the one that is found in the long I-beam bridge.

This contract also includes an unusually large box culvert. Having twin openings each 10 ft high and 20 ft wide, it is built at a skew that makes the length 400 ft. Cost of this culvert alone is about $500,000. There are some big corrugated metal pipes on the job, too. Under the big fill at Tuxedo is one 12 ft in diameter and 404 ft long.

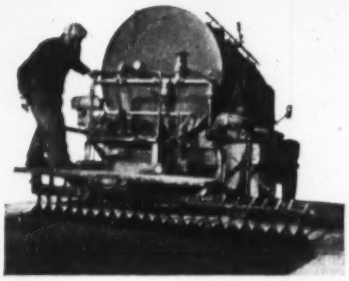
The prize exhibit on this contract, however, is not part of the new construction. In fact it's older than most of the men working on the job.

• **An early road enthusiast**—It is a stone monument standing just outside the Thruway right-of-way, on a patrol road in Bear Mountain-Harriman State Park. The monument is inscribed:

"**This road was built in 1894 by E. H. Harriman to show the advantages of level roads in hilly countries.**"

Mr. Harriman, railroad financier who gave large landholdings in the area to the state of New York, believed in an idea that the New York State Thruway is sure to prove.

BITUMULS® leads in surface treatment work!



You will be interested in these facts obtained in our recent nation-wide survey:

- In the past five years most of the states in the union have *increased* the volume of sealing and surface treatment work done with asphalt emulsions.
- A majority of the counties in the country now *prefer* the use of emulsions to hot asphalt, tar and cutbacks for surface treatments.

BITUMULS LEADS ALL OTHER EMULSIONS for work of this type. As a pioneer product for Surface Treatments, Bitumuls continues as first choice of road-builders everywhere. It has won acceptance based on speed and ease of application, dependable performance, and long economical service. Bitumuls HV (high viscosity emulsion) holds more cover stone than any other binder. It sets-up faster, and provides a safe, non-skid surface.

Our new booklet, "BITUMULS SURFACE TREATMENTS AND PENETRATION PAVEMENTS," gives full details on all types of Surface Treatments, Single, Double and Triple. There are Bitumuls Engineers working out of offices near you who will welcome an opportunity to discuss your Surface Treatment work.

AMERICAN Bitumuls & Asphalt COMPANY

200 BUSH STREET, SAN FRANCISCO 4, CALIFORNIA

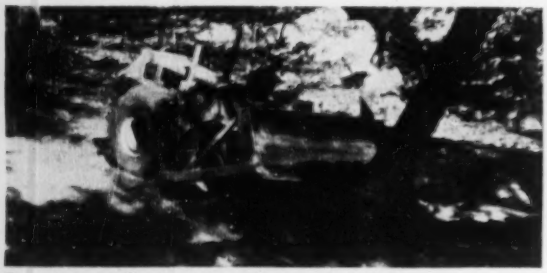
E. Providence 14, R. I. Perth Amboy, N. J. Baltimore 3, Md. Mobile, Ala.
Columbus 15, Ohio Tucson, Ariz. Seattle, Wash. Baton Rouge 2, La.
St. Louis 17, Mo. Inglewood, Calif. Oakland 1, Calif. Portland 7, Ore.
Washington 5, D. C. San Juan 23, P. R.

(*Advertisement*)

Pictures of the month . . . by LeTourneau-Westinghouse

Scrapers keep pace with city traffic

— To handle a wide variety of scattered dirtmoving assignments, the City of Edmonton, Alberta, roads its two C Tournapulls and one rubber-tired Tournatractor all over its 70 square miles. "Our Tournapulls keep right up with city traffic," says Foreman P. Bearham. Traveling through Edmonton, machines usually average 16 mph despite heavy traffic. Top highway speed is 35 mph. "An operator," says Mr. Bearham, "has just as much control of a Tournapull as he has of a car. Positive power steer, big air brakes, make driving the machine absolutely foolproof." Ease of control and speed pay off on the job, too. Operator George Garland reports, "On 4,000 ft hauls, a Tournapull usually can make 5 trips to a crawler's 1."



Stumps 2 acres every 3 hours

— Lifting and pushing at same time, Tournatractor roots out 20" white oak near Dodgeville, Wisconsin. Grubbing and knocking over this big tree took only 6 minutes. "Tournatractor is fine for this work," says Operator Bert Davis. "I can grub and stump 12 acres in about 18 hours." Machine is owned by Iowa County Highway Dept, Wisconsin.

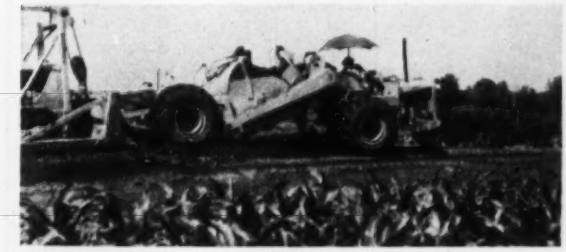
Work alone or with pusher

— Grading 80,000 yd subdivision in Babylon, NY, 3 D Tournapulls owned by Cross Island Constr Co were photographed being push-loaded by 109 hp crawler. Each heaped 6½ pay yds of loam in 30 seconds. Leveling 5,000 yd subdivision in Levittown, another "D", owned by Vogel Bros, self-loaded 5 pay yds of similar material in 45 seconds.

(Advertisement)

. . . with performance reports from around the world

Patches 250 yds in 4 hrs — Laurens County, Georgia, uses its 7-yd D Tournapull for scattered maintenance jobs. Here, "D" moved 250 yds of hard clay and rock to patch the old Savannah road, 7 miles east of Dublin. Job finished in 4 hours, "D" drove 5 mi in 15 min to next assignment. "Best thing I've seen for this sort of work!" says county official John Coleman.

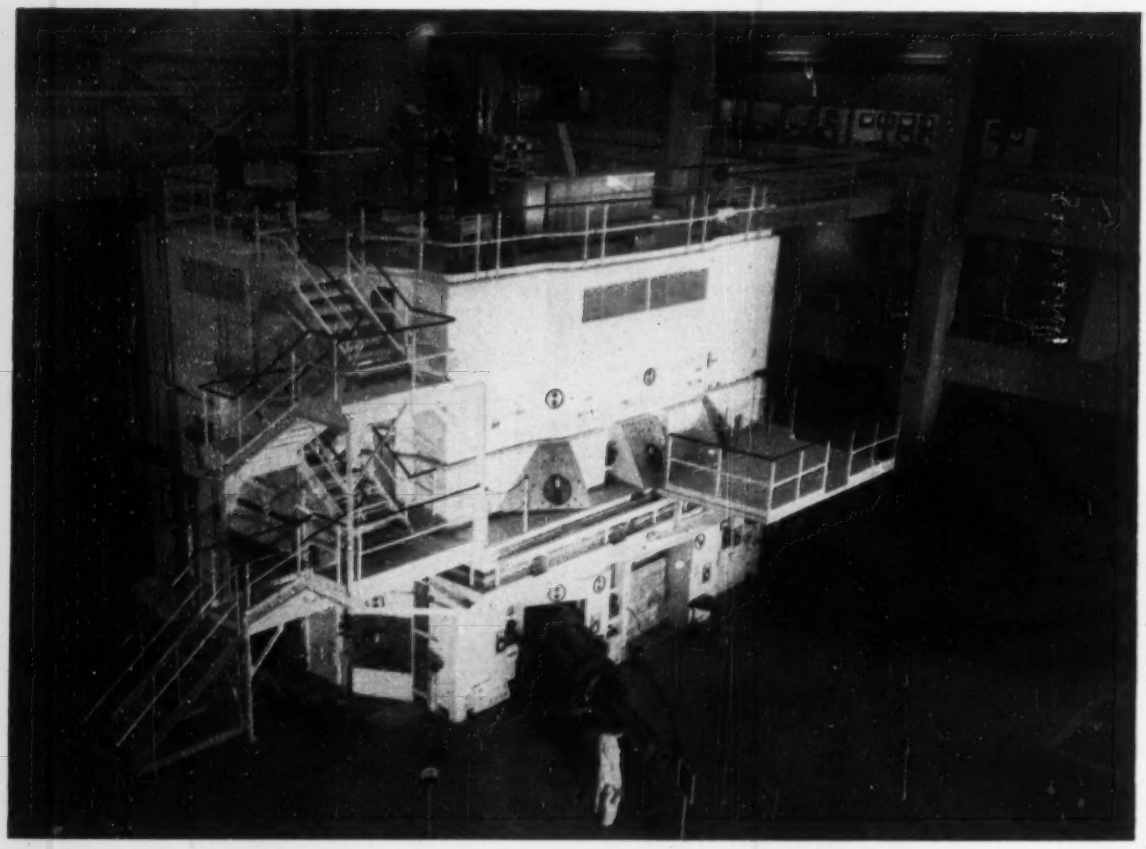


2-to-1 over crawlers — "Tournapulls move more dirt than anything I've ever seen," says A. L. Elston of Rock Island, Ill. On 4¼ mile, 100,000-yd Henderson County road relocation, Mr. Elston's records show his three 7-yd "D's" out-hauled crawler-11-yd-pans, 2-to-1. On 2400 ft cycles, each Tournapull accounted for 9 to 10 loads (63 to 70 pay yds) of sand and silt per 55-minute hour

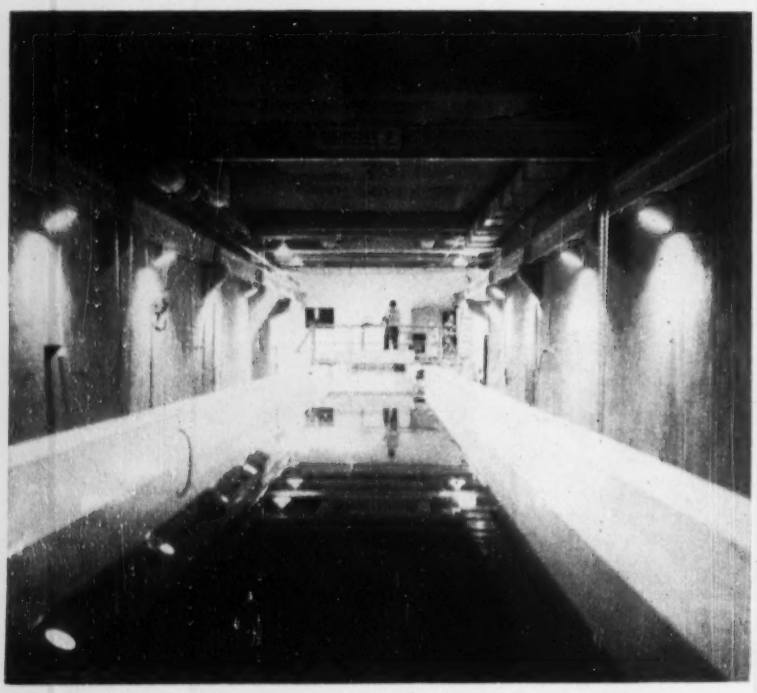
10,000 hrs, tires still good — After working over 10,000 hours, this Tournatractor still is running on its 4 original tires. The 5-year-old Firestones will probably last at least another year before needing replacement. Used mainly for stockpiling bituminous coal, rig handles 10,000 tons monthly for owners, Ohio Edison Co, Akron. It also levels land, spots rail cars, plows snow.

Safe on 19% grades — Stoen Construction Co, Seattle, chose 4 LeTourneau-Westinghouse Rear-Dumps for this 1,100,000 yd relocation of US 101 in mountains southwest of Portland, Oregon. Dumping rock over sheer banks, Rear-Dump operator sets rear-wheel brakes. Front wheels roll free for safe, quick pull-away. On grades steep as 19%, each unit completed a 2800-ft cycle every 10 minutes. For more information on tools shown on these pages, write LeTourneau-Westinghouse Company, Peoria, Illinois.

Tournapull—Trademark Reg. U.S. Pat. Off. Tournatractor—Trademark Pic-679-G



Test reactor aids atomic power plant design



CANAL underlying the reactor serves as a storage chamber for spent fuel.

This unique research apparatus tries out components of future nuclear devices

If low-cost atomic power ever becomes a reality, much of the credit for making a commercial reactor practicable should go to the materials testing reactor (MTR) at the National Reactor Testing Station, Idaho Falls, Idaho, and to the men who designed, built and operate it. For this MTR guides the selection of materials for vital parts of nuclear reactors yet to be built in the future.

A description of this unique research tool was released by the Atomic Energy Commission in mid-May, simultaneously with an announcement that facilities of the MTR are now being made available to the public. (A description of the test facilities at the NRTS was published in ENR Dec. 10, 1953, p. 45, but at that time details of the MTR were withheld for security reasons.) While the released information gives a good idea of the nature of the prob-

lems faced by the builders of MTR, it also may offer valuable clues to some of the problems that might be encountered by constructors of future reactors for atomic power plants and for other types of research.

• **Many buildings needed**—The MTR is located on a 40-acre tract on the Snake River plains, 50 miles west of Idaho Falls. The southern half of the site is an exclusion area for all units in which radioactivity is a factor. On it are the reactor building, process-water building, fan house and stack, plug-storage facility and hot cell, cooling tower, pump house, water-treatment plant, electrical substation and steam plant. Also there are two retention basins, each 125x20x20 ft, for storing contaminated water pending decay of radioactivity.

The reactor building is 130x131 ft by 80 ft high. The first floor of the building is 24 ft below the top of the reactor structure, while at least 40 ft of clearance is provided on all sides of the reactor. A 30-ton crane serves most of the floor area.

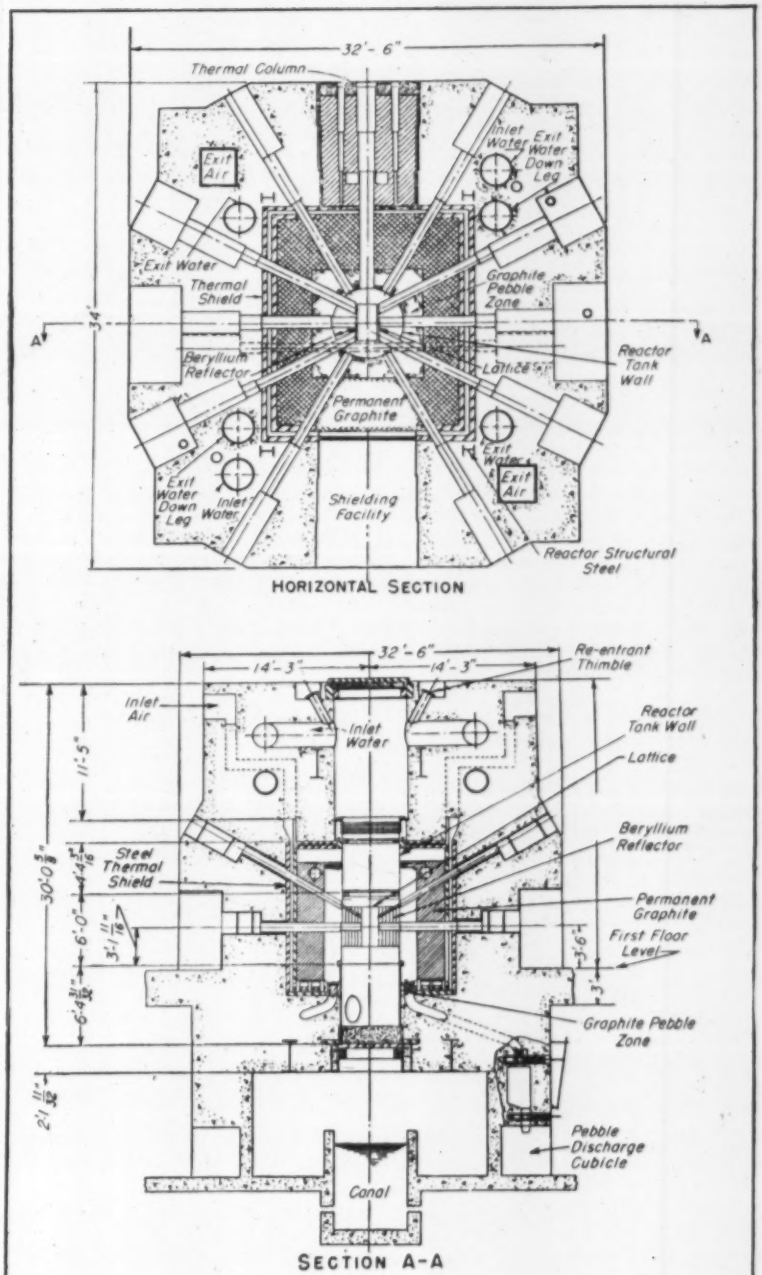
Around the face of the research tool are outlets for electricity, gas, water, steam and air, to service experiments. Additional service outlets are spotted at intervals along the walls of the building. Filtered air is supplied to the building under slight positive pressure, to prevent entry of dusty outside air.

"Warm" drains are available at several points. These lead to a catch tank under the basement, and thence wastes are pumped to control tanks outside the building where the liquids can be tested. After that, the liquids are pumped to larger, permanent, underground storage tanks or to a retention basin.

A wing 128x141 ft, along one side of the reactor building, contains laboratories and shops. The laboratories are equipped with standard services and a small hood-vent system to handle small quantities of "hot" off-gases. Two laboratories are stations for direct delivery of pneumatic shuttles containing materials which already have been tested in the reactor.

Two other facilities also are noteworthy: (1) a reactor service building, 100x160 ft, used for setting up and testing specimens before bringing them to the reactor building for insertion in the apparatus, and (2) a large hot cave, located in a separate building, employed for examining materials in air. It has three shielding windows in one face and a smaller one in another face.

Buildings generally have structural steel frames. Walls are precast concrete panels.

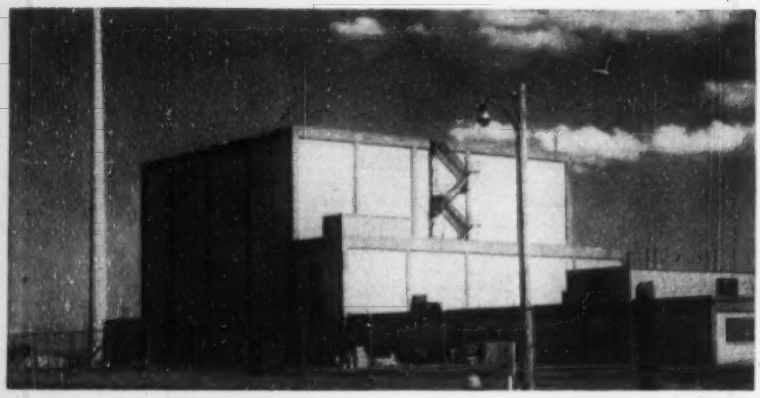


MATERIALS TESTING REACTOR consists of an active core in a "lattice," surrounded by a beryllium reflector and water-filled aluminum tank, a secondary reflector of graphite, a steel thermal shield and a 9-ft-thick barytes-concrete shield.

• **COMPONENTS OF REACTOR**—The MTR was designed primarily to determine the effects of intense neutron radiation on materials and fuel elements to be used in future reactors that will operate at high fluxes and specific power. The unit makes it possible to test materials under simulated operating conditions, including temperature, pressure and coolant. The intensity of flux in the MTR is 10 to 100 times greater than that available elsewhere.

• **Fuel center**—A thermal (slow) neutron reactor, the MTR employs uranium enriched in isotope U-235 as fuel, ordinary water as both moderator and coolant and beryllium as a reflector. Roughly a cube with 32-ft sides, it will generate 30,000 kw.

(Continued on page 42)



REACTOR BUILDING and its laboratory wing are enclosed with concrete panels.

The fuel is contained in an "active core" located inside a "lattice" region 16x28x24 in., which is surrounded by a 3-ft-high reflector made of beryllium pieces. The latice and reflector are enclosed in a 55-in. dia aluminum tank.

Extended by stainless steel sections above and below to form a 30-ft-deep well, the tank is closed top and bottom with heavy lead-filled steel plugs. The top plug is removable when the reactor is not operating so that the fuel in the lattice can be replenished and the beryllium in the reflector changed to accommodate experiments.

• **Storage canal**—After they are spent, radioactive fuel and other radioactive pieces are lifted with grappling tools and lowered through a chute and valve mechanism in the bottom of the reactor tank into a canal holding 18 ft of water. (The reactor tank is always kept filled with water for shielding as well as for cooling.) Unloading is performed through 20 ft of water.

• **Activity control**—Mechanisms that move the rods controlling the reactor's rate of fission are mounted on the top plug. Control is maintained by inserting cadmium, a strong absorber of neutrons, close to fuel elements to stop the chain reaction, or by removing the cadmium just far enough to permit the chain reaction to proceed without multiplying out of control.

• **Graphite reflector**—A secondary reflector of graphite outside the reactor tank provides additional space for testing at high neutron intensity. It consists of a 3-ft thick, graphite-block wall enclosing a space about 7 ft square by 9 ft high surrounding the aluminum tank. This inner zone is filled with 700,000 graphite balls 1-in. in diameter. Cooling air flows over the balls and through holes in the solid graphite.

• **Shields**—Completely surrounding the graphite wall is a thermal shield composed of 4-in.-thick layers of steel, which absorb most of the heat from the graphite and most of the residual energy of radiation from the reactor. A 4-in. space between plates provides a passage for cooling air.

The exterior of the MTR is a concrete shield about 9 ft thick, which reduces radiation to such a small value that men may work safely around the reactor. The concrete was made with barytes (barium sulfate) aggregate (ENR May 13, p. 36).

• **Water and air cooling**—The lattice and reflector are cooled by water flowing at 20,000 gpm. This water was highly purified to minimize contamination as it passes through the reactor. For further prevention of radioactivity in the water—which is re-circulated after cooling by evaporation—a small amount is continuously removed to a retention basin, where it is held until radioactivity has decayed to a safe value. The water is then pumped to a leaching bed.

Large blowers in a fan house create a suction in the reactor structure, to remove the air from the building and discharge it to the atmosphere through a 250-ft-high stack. The air is filtered before passing through the reactor to remove possible radioactive particles.

• **Full of holes**—The MTR differs from other types of reactors in the extent to which the design provides for irradiation of test materials:

Several sections of the beryllium reflectors can be replaced easily by reflector pieces with the proper size holes to receive test specimens. Instrument leads and other connections can be brought outside the reactor through gasketed access holes adjacent to the top plug.

Relatively large openings, known as "beam" holes, are accessible at the outer face of the concrete shield and extend inward to the tank wall, or to the lattice through "thimbles" projecting into the tank. Inner ends of most of these holes are 6 in. in diameter. Since these holes penetrate to the highest flux in the reactor, they are potentially hazardous and must be filled with a shielding plug during reactor operation.

Plugs are made of beryllium, graphite, iron and concrete, depending on the reactor material in which they are inserted. After each experiment, the reactor is shut down, and the plugs, made radioactive inside the reactor, are removed to a storage facility until needed again. They are transported in a 20-ton "universal coffin," the front end of which is shielded with 10 in. of lead. This coffin equipment is shown in the foreground of the picture at the beginning of the article.

Shuttle tubes about 1-in. in diameter penetrate the reactor close to the lattice. Under air or water pressure, shuttles containing experimental material are driven to the region of high flux and retrieved, even in operation.

Irradiation space at reduced neutron fluxes is available in holes accessible from the reactor top. Some of these holes penetrate into the pebble graphite and some into the permanent graphite. Two holes are accessible from a room under the reactor.

• **Thermal column**—A graphite-block thermal column, 6 ft square and 8 ft long, extends outward from the east face of the permanent graphite wall to provide a very pure thermal neutron flux. This column also is penetrated by several experimental holes. At the inner face 4 in. of lead, and at the outer face 10 in. of lead, reduce radiation to a harmless level.

• **"Hottest" spot in U. S.**—Fuel units, on discharge from the reactor and before shipment to a chemical processing plant, may have to be stored under water in the canal for several weeks. Stacked in a rectangular array, these units create an intense field of essentially pure gamma radiation—probably the most intense available.

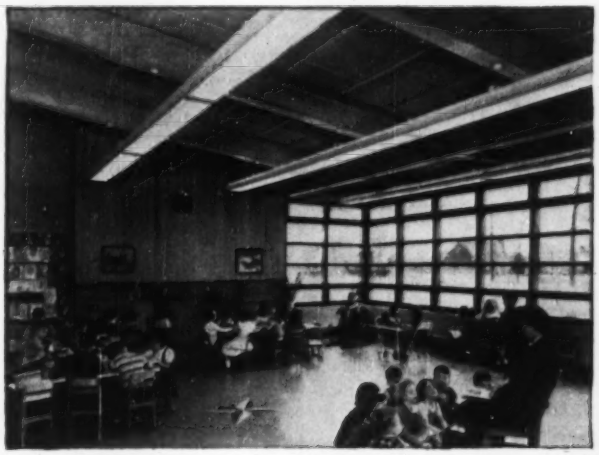
Development of the MTR was a joint enterprise of the Oak Ridge National Laboratory and the Argonne National Laboratory. Design was executed by the Chemical Plants Division of the Blaw-Knox Construction Co. The Fluor Corp., of Los Angeles, constructed the $18-million reactor. Phillips Petroleum Co. is the operating contractor.

Charges will be made for public irradiations in the MTR. Applications should be filed with the U. S. Atomic Energy Commission, Isotopes Division, Oak Ridge, Tenn. For information concerning technical matters relating to irradiation services, scheduling, price lists, and arrangements for obtaining these services contact Phillips Petroleum Co., Idaho Falls, Idaho.

Fiberglas Acoustical Form Board

gives your roofs

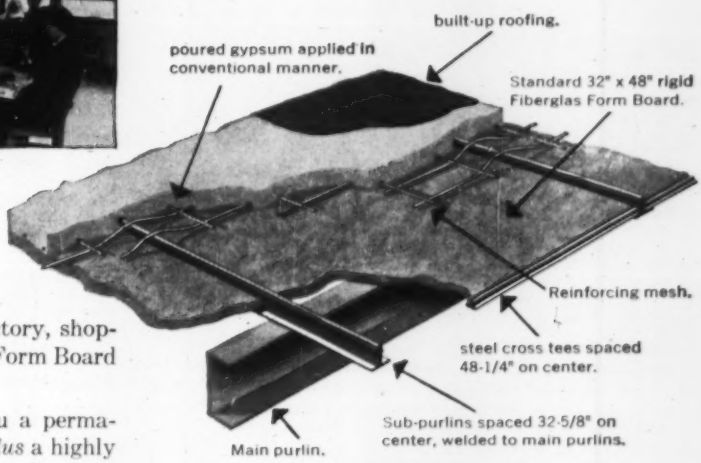
two big extras at one low price!



In a Class by itself: fire-safe, inorganic Fiberglas Acoustical Form Board with gypsum concrete keeps light structures snug, safe, quiet—eliminates cost of ordinary acoustical ceiling. Has N. R. C. of .75.

Extra #1.
A fire-safe acoustical ceiling

Extra #2.
A highly efficient insulation


built-up roofing.
poured gypsum applied in conventional manner.
Standard 32" x 48" rigid Fiberglas Form Board.
Reinforcing mesh.
steel cross tees spaced 48-1/4" on center.
Sub-purlins spaced 32-5/8" on center, welded to main purlins.
Main purlin.

Bucking a building budget for school, factory, shopping center? Consider Fiberglas* Acoustical Form Board as your solution.

Fiberglas Acoustical Form Board gives you a permanent, dimensionally stable form board . . . *plus* a highly efficient insulation . . . *plus* a fire-safe acoustical ceiling. Yet Fiberglas Acoustical Form Board costs no more than an acoustical ceiling alone!

It's easily installed with gypsum in flat, curved or pitched roof framing. Ceiling surfaces are Fiberglas and paintable.

Specify triple-duty Fiberglas Acoustical Form Board for schools, factories, shopping centers, all similar structures . . . get *two big extras* at one low price! For full technical data write Owens-Corning Fiberglas Corporation, Dept. 145-F-17, Toledo 1, Ohio.

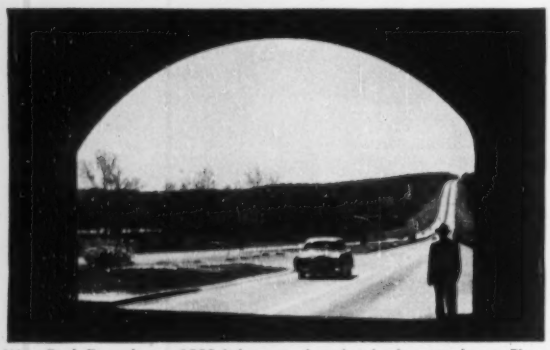
OWENS-CORNING
FIBERGLAS

*Fiberglas is the trade-mark (Reg. U. S. Pat. Off.) of Owens-Corning Fiberglas Corporation.

SOUND CONTROL PRODUCTS • ROOFING INSULATIONS • ELECTRICAL INSULATIONS • DUCT INSULATIONS • LOW TEMPERATURE INSULATIONS

Wilbur Cross Parkway at south end of West Rock's twin-bore tunnel. Highway continues on north side of mountain. Two 24-foot concrete roadways are divided by a grassy median strip. Twelve traffic interchanges permit a free flow of traffic on and off the Parkway. Grade crossings have been eliminated by 19 overpass bridges and 19 underpass bridges.

Parkway Tunnels Help Motorists Escape New Haven Traffic Tangle



West Rock Tunnels are 1200-ft long, and each tube has two lanes. They are equipped with automatic ventilators, traffic control signals, and an elaborate lighting system that matches at all hours the day or night conditions outside the tunnel.

Before the West Rock Tunnels were completed, motorists had to wind through New Haven. Above, Route 10 on Chapel Street near San Raphael Hospital. During rush periods the Parkway saves an hour's driving time.

A few years ago, a trip between New York City and New England inevitably included a bout with New Haven's heavy traffic.

Today, thanks to the West Rock Tunnels, drivers can avoid the New Haven bottleneck and enjoy the Wilbur Cross Parkway's full 29 miles. Named for a former governor, the Parkway rolls northeastward from the Housatonic River Bridge at Milford to the Berlin Turnpike at Meriden.

Estimated cost of the Wilbur Cross Parkway was $17,500,000. Bethlehem furnished steel for the highway, bridges and tunnels.

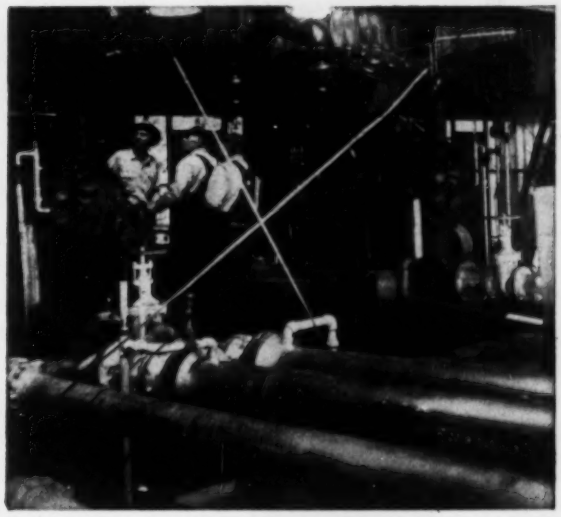
BETHLEHEM STEEL

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

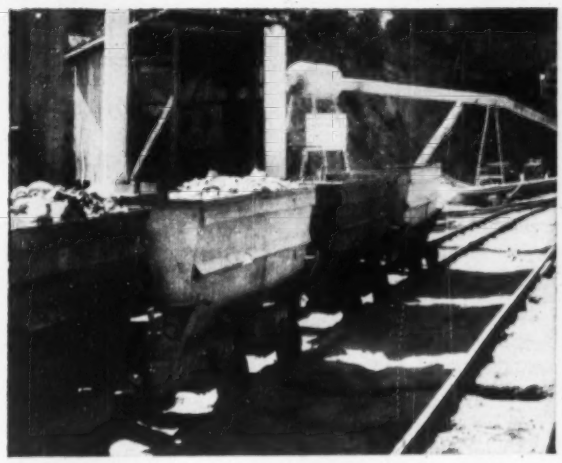
On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

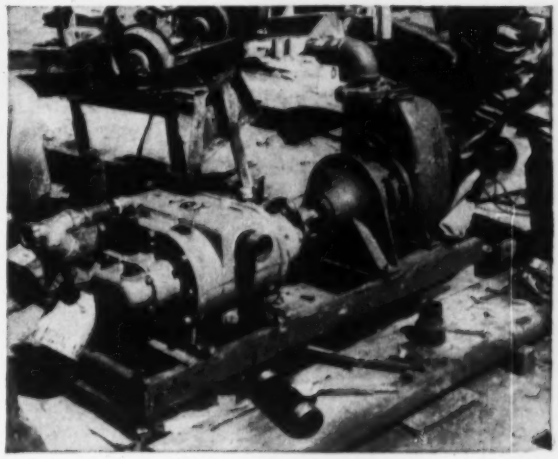
MEN CAN WORK in hot tunnel through use of . . .



DRY AIR—After coolers condense moisture from compressed air to help reduce tunnel humidity.



MOVING AIR—Heavy duty blower moves large quantities of air into tunnel at low pressure.



COOL AIR—Compressed air powers air motor (left) to drive pump, also undergoes adiabatic expansion to become supercooled.

Heat being conquered at Tecolote Tunnel

The hottest tunnel in recent construction history is again being driven — by a new subcontractor combine (see box) — after a shutdown lasting almost a year.

Conditions in the Cachuma Project's Tecolote Tunnel in California are still tough—due to the high inflow of hot water, now up to 4,900 gpm, with water temperatures at the heading reaching 113 F. But, by blowing in lots of air and pumping out lots of water, the heading is being worked —375 ft of progress was made in the first four weeks of resumed excavation.

Considered essential by the new contractor in making the hot-humid tunnel workable are: dry air; moving air; cool air.

And, of course, the air has to be available in large quantities. Here's how these essentials are being achieved:

• **Dry air**—"It's not the heat, it's the humidity" is doubly true in such a confined space as a tunnel. So first efforts by the new Tecolote Tunnel contractor were toward drying out the air.

A major factor in keeping humidity down is to remove incoming water flow as quickly as possible. Accumulated warm water radiates heat and moisture quickly. So first step in making the tunnel workable was to build an underground pump room some two miles from the portal.

At the pump room the tunnel was increased to 17-ft width for a 64-ft length. This was underlain by an 11x11-ft, 8-ft-deep sump. Then two 3,000 gpm pumps were installed, powered by 250-hp electric motors and discharging through two 12-in. lines.

But much more pumping was needed. Water enters through the entire length of the tunnel, so a number of intermediate booster pumps already have been installed to pick up the water as it enters, and more are being added.

Compressed air coming into the tunnel is dehumidified. The contractors have installed two new 1,640-cfm compressors to provide air for tunnel operation, each compressor

with an after-cooler that reduces air temperature to within 2° F of available cooling water temperature. This doesn't provide cold air in the tunnel: the air would warm up by passing through three miles of hot tunnel. But cooling the compressed air condenses moisture in it. This water is trapped and removed.

The compressed air is used for drilling and mucking operations. And it will be used to power pumps which, as will be explained later, will provide cool air.

• **Moving air**—Air in motion is provided by a 200-hp blower rated at 4,700 cfm at 10 psi. This fan air enters the tunnel in a 14-in. pipe and is boosted by a second blower at the pump room. No attempt is made to remove moisture from the fan air. Even so, it is relatively dry, because of low natural humidity outside the tunnel.

The fan-driven air picks up heat as it passes through the tunnel and reaches the heading above 100 F. But, it does have a cooling effect. On one typical day recently the dry bulb temperature of the fan air at the heading was 103 F whereas the wet bulb was 72 F or a relative humidity of 22%. The dryness, plus the air motion, gives a cooling effect.

Most of the fan air goes direct to within, say, 20 ft of the heading. However, at various places along the tunnel fan air is bled off by loosening the bands around the pipe. For example, considerable air is needed at the pump room to overcome the heat of the operating equipment there. And air is needed at the passing track during mucking operations. No attempt is made to exhaust air immediately after a blast. The workmen pass through blast fumes shortly after the explosion to the heading where the air has been freshened by fan air coming from the outside.

So far, the installations already described are all required to perform necessary operations. The heading is three miles from the portal—and the most difficult section from a comfort standpoint is the mile between the pump station and the heading. Temperature in this area reaches nearly 100 F with 100% humidity.

One standard procedure is for workmen to ride in muck cars filled with water, with only their heads exposed. The water used comes from a relatively cool underground spring intercepted by the tunnel about 1½ miles from the portal.

Another procedure is to run the man-haul cars under a deluge of water that completely soaks the men. Evaporative effect as the train moves through the tunnel does the cooling.

During the most difficult temperature and humidity conditions, the men literally worked out of muck cars full of water. They would work for a while and then sit for a spell in the water-filled muck cars until able to get out and work again.

• **Cool air**—Steps are being taken by the contractor to provide a considerable amount of cool air in the tunnel, by operating 125-hp air motors. The compressed air, as it operates the motor, undergoes adiabatic expansion that supercools it. The potential energy of the compressed air is thus turned into useful work instead of heat. In theory the air thus could be cooled substantially below 0°F. But since such motors are not highly efficient, the contractor is looking for only a near-zero temperature.

At one stage, the contractor considered turning generators with the air motors. But the electricity would have had to be taken elsewhere to do useful work. And as pumping is needed, the air motors are attached to pumps that will help remove additional water.

Nothing is known about conditions in the remaining 4,300 ft of the tunnel. The water could continue to

(*Continued on page 48*)

History of a hot tunnel

Hot water inflow did not become an intolerable problem in the 6.4-mile Tecolote Tunnel until almost three years after work started. But high water flows and squeezing ground much earlier had presented other serious construction problems.

A $4.8-million contract was awarded in January, 1950, for construction of the 7-ft dia (inside finish concrete) horseshoe tunnel to Halvorsen Constructors (a joint venture of Carl Halvorsen, Inc., and H. Halvorsen, Inc.). Driving the north heading (inlet end) started soon thereafter and continued almost without interruption until March, 1952, when 14,919 ft had been dug. It was then stopped to permit lining of this 3-mile section before possible rising water in the Cachuma Reservoir would interfere. Only serious problem in the north end was interception of a strong water flow early in 1951 that included methane gas and sand. A relief well dug adjacent to the tunnel discharged a considerable amount of gas and may have reduced the quantity entering the tunnel.

Start of the south heading (outlet end) was delayed until May, 1950, while an access road was being constructed. Early progress on both headings was good, with the maximum being a total of 1,942 ft in the month of August, 1950.

Water flow in the south heading did not become serious until two miles of tunnel had been driven, a year and a half after construction started. Then a section of squeezing ground, with water inflow exceeding 3,000 gpm, tied up construction for almost a year. The inflow carried in large quantities of fine material. In September, 1952, work was started on lining a 240-ft long section of the worst ground. This was followed by extensive grouting ahead in an attempt to reduce water flow—the temperature of which had now reached 87 F.

A combined program of tunnel driving and grouting was resumed late in 1952 with some considerable progress being made—as much as 456 ft during March, 1953. But water inflow continued high and water temperature gradually increased as the tunnel was driven. With inflow up to 3600 gpm and water temperature up to 112 F, the contractor stopped work in July, 1953, for a re-evaluation of the conditions. One purpose of the shutdown was to obtain a determination of cost to be borne by the contractor and by the government as a result of the unforeseen conditions.

During the shutdown a complete study was made by a consulting board retained by the Bureau of Reclamation to determine how best to tackle the remaining 4,716 ft of tunnel (ENR Nov. 26, 1953, p. 25). The consulting board suggested the possibility of lining the tunnel to the heading before resuming excavation work. This was not done as is explained in the accompanying article.

After the study, new prices were negotiated for completion of the tunnel. And a joint venture of Coker Construction Co. and Peter Kiewit Sons Co. agreed to complete the job. Officially the Coker-Kiewit group are subcontractors to the original Halvorsen organization. Actually, they are doing the work as if prime contractors.

Most notable price change was for excavation. The original price was $44 per cu yd; the new price is $447 per cu yd. This pertains to the 11,100 cu yd remaining.

The change also permitted the contractor to do grouting at his option rather than as directed by the government. And the new price includes such grouting as he may see fit to do. Net increase in the contract price as a result of the new figures is $4,176,350. The tunnel work was resumed in February, and driving started April 12, 1953.

Meanwhile other elements of the Cachuma Project substantially have been completed. The high water flow has been put to good use particularly in supplementing the municipal water supply for the city of Santa Barbara. It also has been distributed to irrigators, although distribution systems are not completed.

5 Peerless Pump Designs

that squarely meet every WATER HANDLING REQUIREMENT

PEERLESS PUMPS

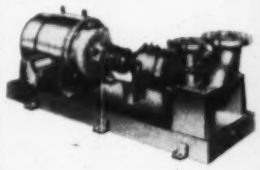
THESE ARE THE *Pumps*	ASK FOR *FREE* ENGINEERING BULLETINS

TYPE A AND TYPE AS GENERAL PURPOSE PUMPS

Use these pumps in the widest range of water handling services. Single stage, horizontal split case design. Mechanical shaft seal construction available in sizes up to 4" (Type AS). Heads: up to 300 ft.; capacities up to 70,000 gpm.

Ask FOR BULLETIN B-1300 & B-1350

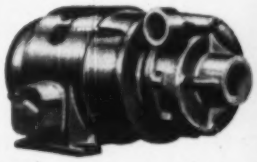
TYPE PR AND TYPE PRS HIGH TEMPERATURE, HIGH PRESSURE PUMPS Horizontal center-line-mount pumps with packing gland or mechanical shaft seal construction. End or top suction designs. Heavy duty pumps for heads up to 675 ft. Capacities: up to 1000 gpm and temperatures up to 850°F.



Ask FOR BULLETIN B-1605

TYPE PE AND TYPE PB END-SUCTION PUMPS

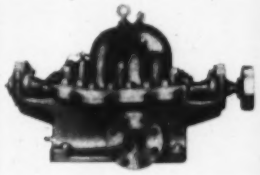
America's broadest line of economical, general purpose pumps. Horsepower range from ¼ to 150. Head range to 260 ft. Capacities up to 5500 gpm. Easy to buy, apply, install and maintain. Tens of thousands in use.

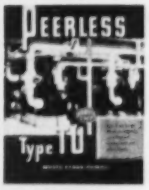


Ask FOR BULLETIN B-2300

TYPE TU AND TYPE TUT MULTI-STAGE PUMPS

2,3,4 and 5-stage designs for supplying, circulating and boosting water and other liquids in moderate capacities against medium and high heads. Durable and dependable in operation. Heads up to 1660 feet; capacities up to 3000 gpm.

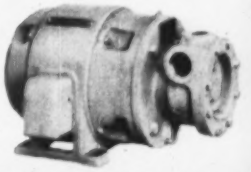




Ask FOR BULLETIN B-1400

TYPE TVE AND TYPE TVB TURBINE VANE PUMPS

For pumping hot and cold, clear and vaporous liquids in small capacities against high heads. Widely used throughout industry for water boosting, circulating, transferring. Easy to install and maintain. Capacities: up to 58 gpm; heads up to 800 feet.



Ask FOR BULLETIN B-2205

MAIL COUPON FOR ILLUSTRATED BULLETINS

PEERLESS PUMP DIVISION
FOOD MACHINERY AND CHEMICAL CORPORATION
301 W. Ave. 26, Los Angeles 31, California

Please send Bulletins checked below

- ☐ Type A Bulletin B-1300
- ☐ Type AS Bulletin B-1350
- ☐ Type PR-PRS Bulletin B-1605
- ☐ Type PE-PB Bulletin B-2300
- ☐ Type TU Bulletin B-1400
- ☐ Type TVE and TVB Bulletin B-2205

NAME_____

ADDRESS_____

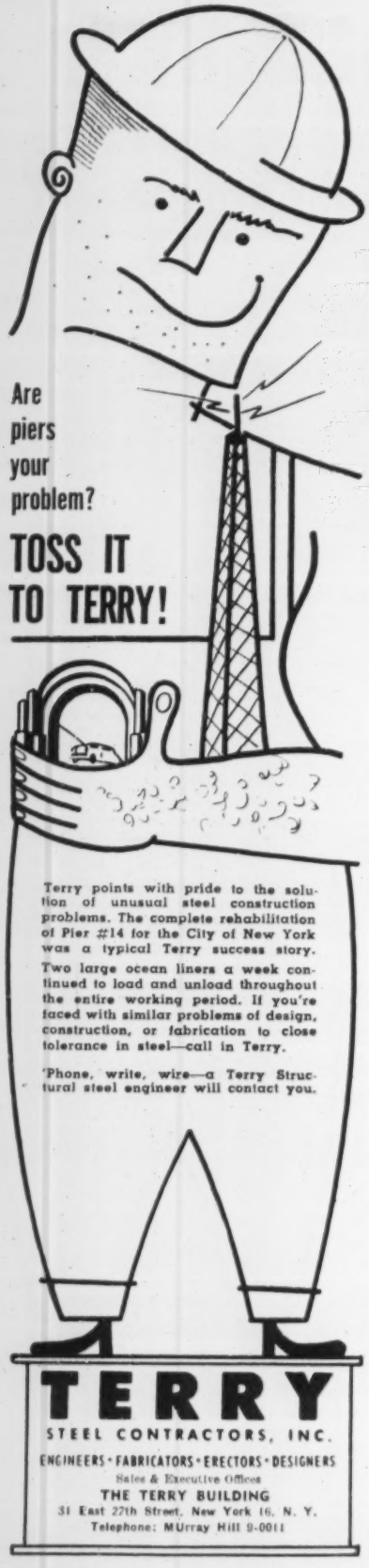
CITY_____ STATE_____

PEERLESS PUMP DIVISION
FOOD MACHINERY AND CHEMICAL CORPORATION

Factories: Los Angeles, Calif., and Indianapolis, Ind.
Offices: New York; Atlanta; Chicago; St. Louis; Indianapolis; Phoenix; Fresno; Los Angeles Dallas, Plainview and Lubbock, Texas; Albuquerque, New Mexico.
Distributors in Principal Cities; Consult your Telephone Directory

PEERLESS PUMPS

fmc


Are piers your problem?
TOSS IT TO TERRY!
Terry points with pride to the solution of unusual steel construction problems. The complete rehabilitation of Pier #14 for the City of New York was a typical Terry success story.
Two large ocean liners a week continued to load and unload throughout the entire working period. If you're faced with similar problems of design, construction, or fabrication to close tolerance in steel—call in Terry.
'Phone, write, wire—a Terry Structural steel engineer will contact you.
TERRY
STEEL CONTRACTORS, INC.
ENGINEERS • FABRICATORS • ERECTORS • DESIGNERS
Sales & Executive Offices
THE TERRY BUILDING
31 East 27th Street, New York 16, N. Y.
Telephone: MUrray Hill 9-0011

WORKERS RIDE man-haul cars into tunnel. In hottest section they often ride immersed to their necks in water-filled truck cars. Narrow cars permit passing tracks inside the 7¾-ft rib spacing without widening the tunnel.

get hotter. More inflow could be encountered. If that's the case, the contractor will add equipment of the type previously described, as needed. An additional pump station may be required.

In all probability conditions will stay about as they are. When work was stopped on the inlet end, water temperature had reached 78 F and flow had reached 400 gpm. This indicates a tapering off of the water conditions as holing through becomes imminent. A minor fault evidenced on the surface is yet to be encountered. What the nature of this fault will be and what effect it will have on the water flow is not known.

• **Safety stressed**—Aside from the water and humidity, another unusual aspect of this tunnel work is the high degree of emphasis placed on protection and comfort of the workers. Each man applying for work underground is given a complete physical examination at the contractor's expense. Included are chest X-rays and electrocardiograph heart tests. Any suspicious health condition automatically leads to rejection of the employment application.

This has paid off handsomely: In the first two months of the work, only one minor heat prostration case has developed. The earlier contractor ran into many such cases.

The contractor has constructed a new change room for employes with individual lockers, showers and other facilities. The workers are paid on a change-room-to-change-room basis: they get 9 hours pay for 8 hours work at the heading. Miners are given a 13¢ an hour bonus payment over the standard $2.42. Work is on a 6-day week basis.

Safety engineers are on the job nearly 24 hours a day. Tests are made in the tunnel at least once a shift for methane gas. And temperature of the water at various places is carefully recorded.

A. M. Coker of Coker Construction Co. is project sponsor for the joint venture of Coker Construction Co. and Peter Kiewit Sons Co. Ray Blasongame is general superintendent for the joint venture. D. R. McGregor serves as chief engineer.

The Cachuma Project is administered by the United States Bureau of Reclamation with E. R. Crocker as project manager.

Garrison Dam spillway work awarded 1953 safety record

A plaque for having the best safety record in heavy construction in the entire United States during 1953 has been awarded to the Garrison Dam Spillway Constructors, a combine of five large companies building the spillway. The Associated General Contractors presented the award to Joe Kellogg, project manager for the firm, which had only three minor injuries in over 500,000 man-hours worked last year. Contest for the award involved 28 large companies working a total of 74,113,677 man-hours during 1953.

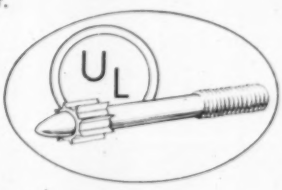
DRIVE-IT: 70% FASTER!

Pneumatic outlet racks anchored to concrete floor 70% faster than by conventional methods, electrical outlets to concrete walls in less than 20 seconds per bolt.

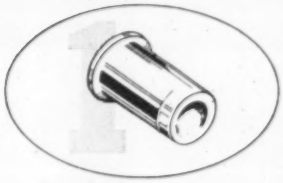
NEW EXCLUSIVE

DRIVE-IT 320
WITH
BREAK-OPEN ACTION

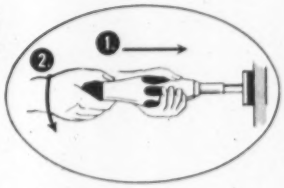
Snap open action results in the fastest operating tool on the market. Easiest method to load and eject cartridges under any condition.



Drive pins are Underwriters' Laboratories approved.



Controlled Power. First and only tool which requires but one standard power load regardless of penetration desired. No need to buy and stock various strength power loads.



Three-way Safety. Cannot be discharged accidentally, due to the push and turn firing sequence. This, plus the large, swivel safety pad, makes DRIVE-IT triple safe.

More fastenings per hour with this speedy way of loading and ejecting cartridges.

SEND THIS COUPON FOR FULL DETAILS

POWDER POWER TOOL CORP.
Dept. I, 7526 S.W. Macadam Ave., Portland 1, Ore.
Canada: Ammo Power Tool Co., Ltd.
735 Broadway, Vancouver, B. C.

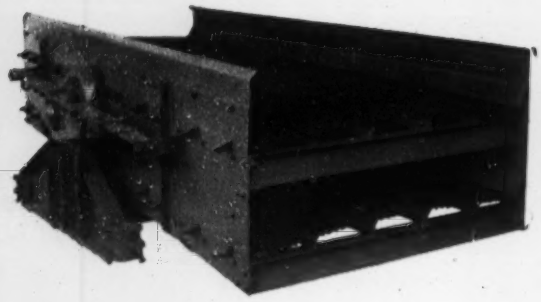
☐ Please send FREE catalogue and literature.
☐ I want a FREE demonstration of *DRIVE-IT*.

Name_____
Street_____
City_____ State_____

DRIVE-IT
the original **POWDER-ACTUATED TOOL**

HEWITT HR ROBINS can cut your handling costs *with this complete*

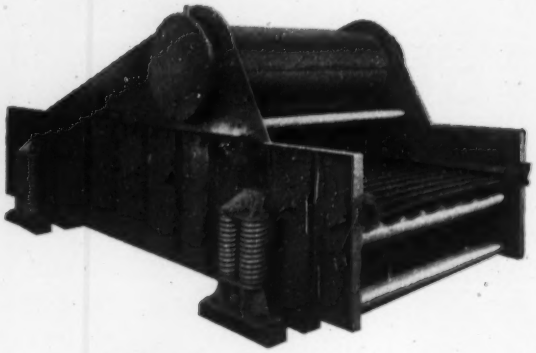
FOR SCREENING



GYREX°

Positive Stroke 4-Bearing Screens

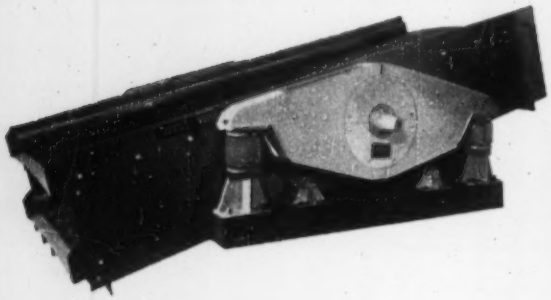
STROKES: ¼" at 1,000 r.p.m. and ½" at 625 r.p.m.
SIZES: Complete range of standard sizes from 48" x 78" to 72" x 192".
DECKS: Single—Double—Triple.
MOUNTINGS: Anvil-type cast iron base with *exclusive angle adjustment* for floor mounting—Steel I-beam base for suspended or rigid mounting.



ELIPTEX°

Horizontal Operating Flat Screens

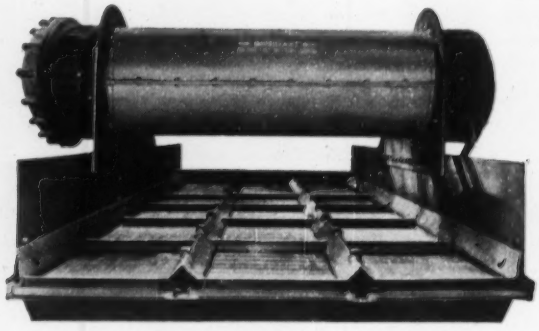
STROKES: 7/16" nominal at 1,000 r.p.m.—Other stroke and speed combinations available to meet special applications.
SIZES: All standard sizes from 36" x 96" to 72" x 240".
DECKS: Single—Double—Triple.
MOUNTINGS: Floor mounted or Suspended arrangement.



VIBREX°

Full-Floating, Unbalanced Pulley-Type 2-Bearing Screens

STROKES: Available in many stroke and speed combinations ranging from ¼" at 1,800 r.p.m. to ½" at 660 r.p.m. —All Vibrex screens have readily adjustable stroke to meet the most exacting operating conditions.
SIZES: All standard sizes from 16" x 30" to 72" x 192".
DECKS: Single—Double—Triple.
MOUNTINGS: *Exclusive angle adjustment* for floor mounting —Cable arrangement for suspended mounting.



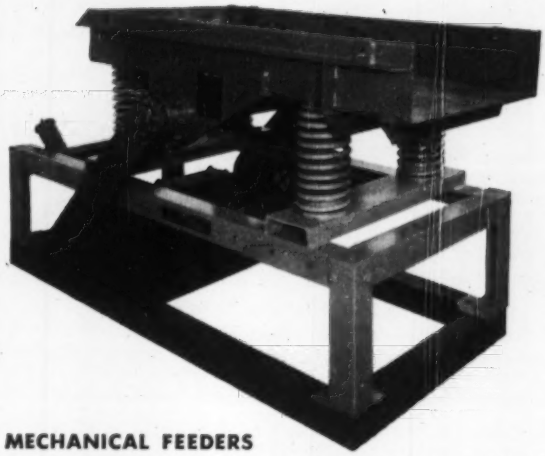
ELIPTEX DEWATERIZER

Specially Designed Eliptex Screen With Micron-Size Opening Stainless Steel Flat Rod Deck

STROKE: Extra-full stroke operating at high speed for maximum efficiency to handle even the most difficult dewatering problems.
SIZES: All standard sizes from 36" x 144" to 72" x 192".
DECKS: Single—Double.
MOUNTINGS: Same as Eliptex Screens.

line of Vibrating Equipment

FOR FEEDING & CONVEYING



MECHANICAL FEEDERS

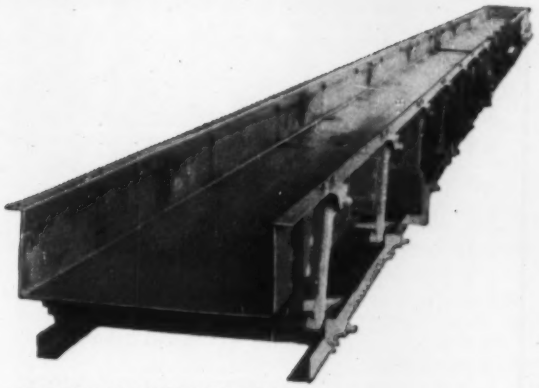
A *fully mechanical* vibrating feeder that is easily maintained by your own personnel. Extremely high capacities at very low power consumption.

FEED CONTROL: Remote, wide range, variable speed controls available.

STROKE: Full 3/16" at 1,000 r.p.m. readily adjustable . . . ideal for handling material of varying characteristics.

SIZES: All standard sizes from 24" x 48" to 48" x 96".

MODELS: Standard—Heavy duty models and special pans and deck designs available . . . suspended or base mountings.



VIBRATING CONVEYORS

A continuously balanced vibrating conveyor offering longer units with higher capacities at lower horsepower than ever before available. Ideal for handling a wide range of materials be it wet or dry, lump or pulverized, packaged or loose, hot or cold, abrasive or corrosive.

SIZES: Standards from 8" to 48" wide up to 150′ long with single drive.

STROKE: Full strokes from 1/4" to 3/8" at speeds of approximately 750 r.p.m.

MODELS: Standard—Heavy duty models and special pan designs and arrangements available.

FOR SHAKING OUT

CAR SHAKEOUTS

Will handle wet, compacted and even partially frozen loads. Capacities vary depending upon characteristics of material . . . Typical unloading time under 5 minutes per car.

MODELS: 5-Ton HD (Heavy-Duty) for handling up to 100 cars per day—3½-Ton GS (General Service) generally recommended for up to 10 cars per day. Both models available with companion twin-hook Car Shakeout Hoist.

STROKE: 5/32" at 1,500 vibrations per minute (easily adjusted for specific applications).

Patent No. 2,504,789

FOUNDRY SHAKEOUTS

Successfully used in steel, iron and non-ferrous foundries of all types (production and jobbing) handling castings weighing from a few ounces up to 60 tons.

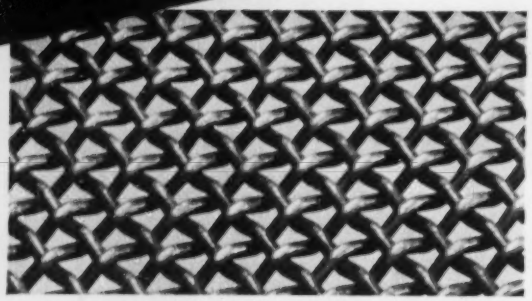
SIZES: From 2′ x 2′ to 8′ x 10′ in single units. Multiple unit arrangements up to 16′ x 33′.

CAPACITIES: Up to 300,000 # (150 tons) in multiple units.

STYLES: Standard Stationary, Portable, Gravity Self-Discharging and Mechanical (Horizontal) Self-Discharging.

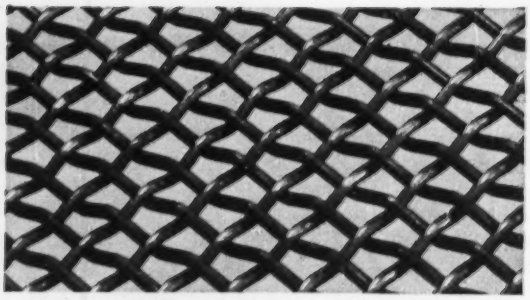
AND FOR YOUR SCREEN CLOTH NEEDS

HEWITT HR ROBINS can cut your handling costs with a complete



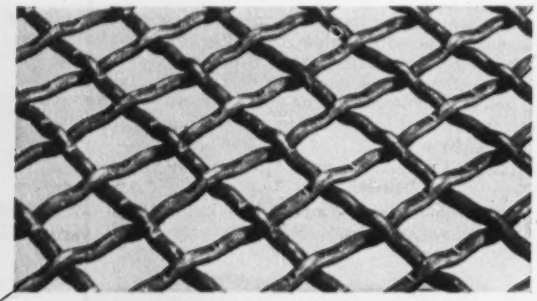
SQUARE OPENING DOUBLE CRIMP

All wires are specially crimped so that a spring tension permanently locks them together at each intersection. This guarantees tightness of weave and accurate sizing because openings cannot vary.



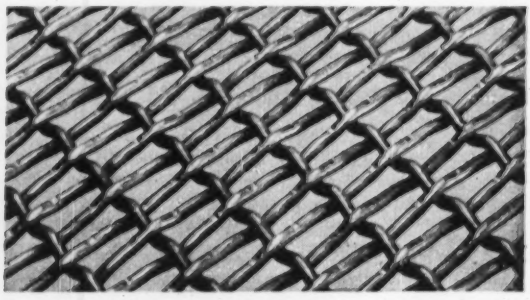
RECTANGULAR OPENING

Recommended for high speed sizing where accuracy is secondary. Rectangular weave provides greater open area hence higher capacity. Furnished with double crimp or flat top weave.



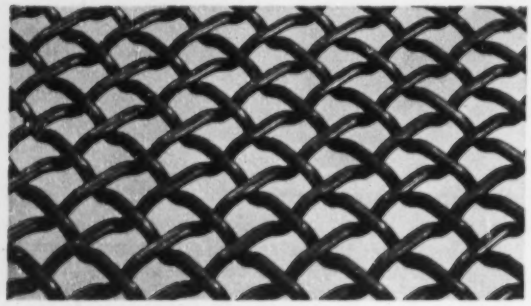
SQUARE OPENING LOCK CRIMP

Ideal for scalping. Has additional crimp to lock wires together under pressure to prevent wires from shifting as a result of impact and handling of oversize materials.



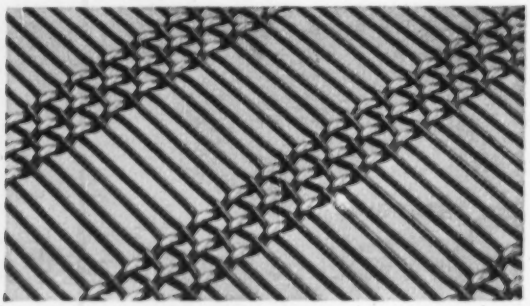
NON-SPREADER

Best for high speed sizing of coarse materials. Heavy-duty wires assist in maintaining accuracy of opening even under impact of wedge-shaped stone and over-sized materials.



FLAT TOP

Crimp characteristics provide smooth screening surface. Absence of high spots, as in other types of crimp, permits free flow and reduces abrasive action of material. Assures longer wear, faster screening and less degradation.



NON-BLIND

Recommended for processing moisture-laden materials that plug or blind openings. Slotted openings kept free from blinding due to secondary vibration set up in longer span wires. Clustered wires carry heavy tension and are crimped to maintain width of opening.

line of Screen Cloth

Each Type of Hewitt-Robins Screen Cloth is Specially Engineered To Accurately Size Large Tonnages . . . Last Longer . . . Cut Your Screening Costs

Hewitt-Robins Screen Cloth guarantees overall sizing accuracy through precision-weaving of individual screen cloth wires. You get longer service because Hewitt-Robins utilizes a full range of metals in its selection of wire to assure that each panel of screen cloth is matched to meet individual job requirements. Types of wire range from genuinely oil-tempered through spring steel, stainless steel, enamel-coated and on to special alloys of extraordinary corrosion and heat resistant properties.

In specific installations where the more abrasive materials such as coke, iron ore, stone, gravel and coal are handled, specify Hewitt-Robins Super-Gyraloy. It's the specially treated oil-tempered wire that combines hardness—stiffness—elasticity—ductility—toughness . . . and must pass exacting laboratory tests for uniformity of these properties.

For operations involving a dust factor aggravated by moisture (as in sizing fine coke and iron ore) specify Hewitt-Robins Super-Gyraloy Enamel Coated Screen Cloth. The enamel coating prevents the build-up of the blinding compound . . . protects the surface against moisture and averts oxidation of the metal.

Where initial cost is of primary consideration and abrasion is not excessive, Hewitt-Robins Gyraloy® spring steel screen cloth provides maximum efficiency and economy. For special applications Hewitt-Robins Screen Cloth comes in plain or galvanized steels, brass, phosphor-bronze, Monel and other ductile alloys.

Hewitt-Robins Screen Cloth is available in standard production size openings from 3/16" and coarser . . . wire sizes from .105" diameter up to and including 1" diameter.

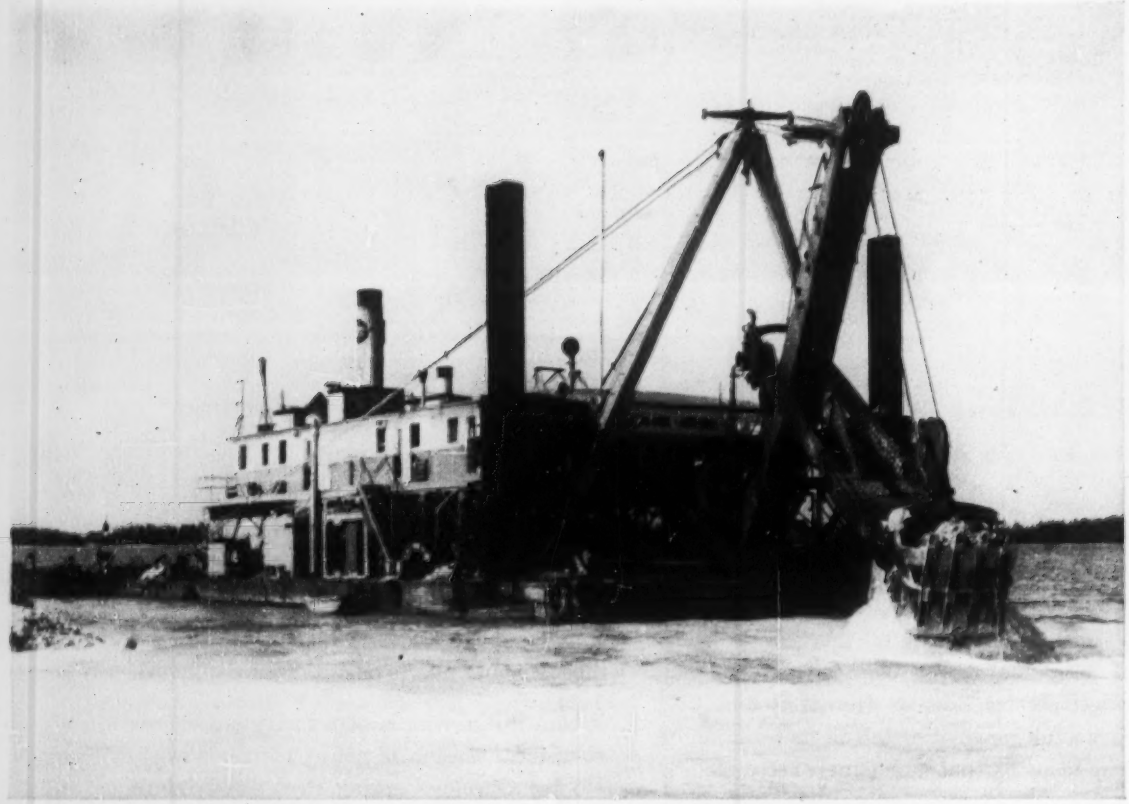
For complete information regarding the kind, type and opening of Hewitt-Robins Screen Cloth to best fit your operation . . . give you highest screening efficiency at lowest cost per ton . . . contact Hewitt-Robins Incorporated, Robins Conveyors Division, 270 Passaic Avenue, Passaic, New Jersey, or your nearest Hewitt-Robins representative.

HEWITT HR ROBINS

Executive Offices, Stamford, Connecticut

DOMESTIC DIVISIONS: Hewitt Rubber • Robins Conveyors • Robins Engineers • Restfoam

FOREIGN SUBSIDIARIES: Hewitt-Robins (Canada) Ltd., Montreal • Hewitt-Robins Internationale, Paris, France • Robins Conveyors (S. A.) Ltd., Johannesburg • **EXPORT DEPARTMENT:** New York City.



BIG DIPPER CHEWS A MOUTHFUL of bay-bottom coral as it excavates the underwater trench that will hold the force main.

Dredgemen and divers win Biscayne Bay race

A race against time is approaching a photo finish at Biscayne Bay, Florida, where deep-sea divers, dredgemen, engineers and construction workers have been hustling underwater installation of a 72-in. reinforced concrete sewage force main in the bay floor.

The line, running from Miami to the city's new 47 mgd secondary treatment plant on Virginia Key in the bay, will be completed in July.

While confident now of victory, contractors have been working to a schedule that's a little too close for comfort. They started last January—after the end of the rough-weather season—and have pushed to complete the job before mid-August high winds and rough seas force a shutdown.

"Operation Biscayne Bay" as the campaign is called, has been carried on by a 40-man crew of divers, engineers and dredgemen.

The project had its beginning in May, 1953, when Miami property owners voted 4½ to 1 in favor of spending $27 million to end the dumping of raw sewage into the bay. The overwhelming vote climaxed an extensive campaign waged by Miami newspapers, the medical association and city officials.

• **How much will $27-million buy?**—The vote was, in effect, the placement of an order by Miamians for a $16-million package containing the 14,353-ft, 72-in. underwater pressure sewer, the treatment plant, and a 4,500-ft underwater outfall sewer into the Atlantic Ocean.

It also meant approval of $11-million worth of revenue bonds for the construction of interceptor sewers and pumping stations on the mainland.

The first package will mean an annual increase in property tax of $2.04 per $1,000 valuation, and the second will necessitate a 100% surcharge on the water bills of every contributor to the system.

The unusual system is worth every penny that will be spent on it, according to Miami residents.

When Merritt-Chapman & Scott was awarded the pipelaying contract, it passed project management duties along to its veteran hand, Captain Crooks, who has supervised the 40-man crew and a small fleet of dredges.

• **Operations**—Strung out 1,000 ft apart across the bay, the dredges work simultaneously on the four-stage pipe laying operation.

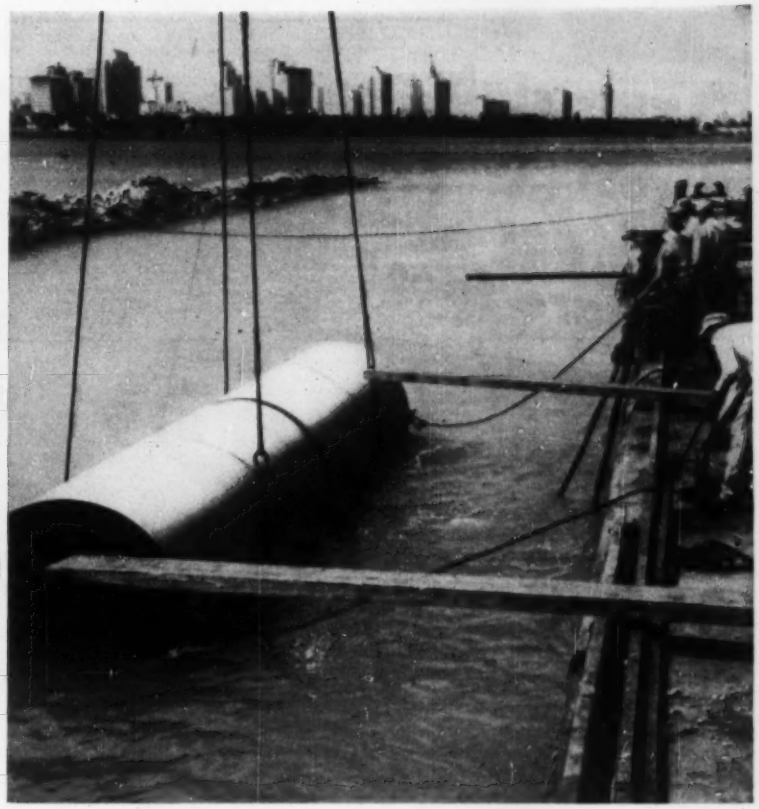
In the van of the fleet is the suction dredge that removes the sludge, sand and silt from the bay bottom along the line of the trench. This operation presents fewer problems than similar ones in other regions, because the bay floor in this area is of coral and it lends itself to suction operations more readily than most bay or harbor bottoms.

Behind the suction dredge is the dipper dredge that excavates the trench. Then, the derrick dredge places a crushed stone bed in the trench area to provide uniform bearing for the pipe.

Finally, the dredge with a 75-ton M-C&S whirley type derrick lays the pipe. Guided by marker pilings to show the position of the last pipe length laid, the derrick swings a 32-ft section of pipe overside and lowers it to a point just clear of the bed material.

Two deep-sea divers descend, one on either side of the pipe and direct its final laying by means of underwater telephones.

The divers thread three-ft bolts on the pipe section through lugs on other side of the previously laid section and pull them tight. Joints are of a rub-



DIVERS DIRECT OPERATIONS and make up the pressure-tight joints after the pipe section has been lowered to its bed.

ber self-sealing type, and are bottle-tight when the bolts are secured.

The divers then place two wood and concrete blocks 6 in. x 12 in. x 8 in. under each 32-ft section, with two 10 x 10-in. wooden wedges on either side of the section to steady the pipe in its berth.

• **Timing is vital**—Although the crews have been hampered by heavy Florida rains, they have maintained an average of almost six sections, or about 192 ft, per day.

They keep things moving by loading the derrick dredge with all six sections of pipe in the morning, returning at night to reload for the following day's operation. This sounds simple—but each section weighs 32 tons.

The force main, designed to operate at 50 psi, runs up grade across the bay, starting at a point 27 ft below sea level on the Miami side, and gradually sloping up to a depth of three feet at the Virginia Key end of the line.

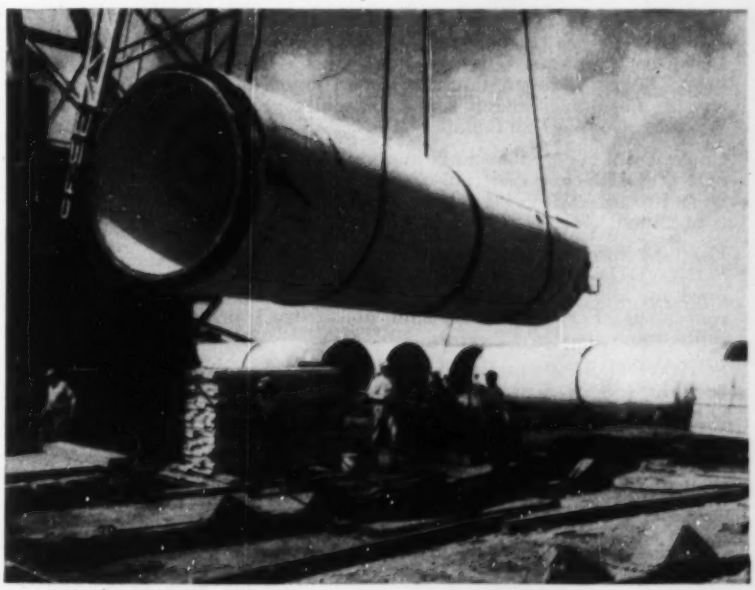
All pipe is manufactured in 16-ft lengths at the Miami plant of Price Bros. Co., whose home office is in Dayton, Ohio. Two lengths are joined prior to installation to make up the 32-ft section, thus eliminating half the underwater joints to be made up by divers.

The plant is located eight miles from the loading dock, and the length of the double-sections necessitates separate haulage through downtown Miami on a tandem axle truck and tandem trailer.

Most of the 453 sections that will make up the finished sewer are in place and ready for use upon the completion of the whole project—some two and a half years hence.

• **System features**—Sewage will be prechlorinated at two identical mainland pumping stations in Miami. These

(*Continued on page 56*)



DOUBLE-SECTION LENGTH—all 32 tons of it—is swung from dock to dredge.

SONOVOID

FIBRE TUBES

for voids in concrete construction

Construction of slab showing SONOVOIDS —Windsor, Conn. High School, A. J. Macchi, Structural Engineer, designer, A. E. Stevens Co., contractors.

Lower cost per square foot resulted when SONOVOID Fibre Tubes were used in the construction of lightweight, fireproof concrete slabs for roof and floors of Windsor, Conn. High School.

Contractors everywhere have found out that by using SONOVOIDS less concrete and less reinforcing steel is required and yet the same structural strength is obtained.

Easy to handle, simple to put in place, low cost SONOVOID Fibre Tubes have been specifically developed for use in concrete bridge deck, wall, floor and roof slabs. For prestressed and poststressed precast units, too.

SONOVOIDS are supplied in specified lengths or sawed to your requirements on the job. Sizes 2" to 36.9" O.D. up to 50' long.

See our catalog in Sweet's

For complete technical data and prices—write

SONOCO PRODUCTS COMPANY
Construction Products Division
LOS ANGELES, CAL. 5353 SOUTH WESTERN AVE
HARTSVILLE, S. C. — MAIN PLANT
MONTCLAIR, N. J. 14 SOUTH PARK STREET
GARWOOD, N. J.
BRANTFORD, ONT.
AKRON, IND.

sonoco
"SERVES THE WORLD"
PAPER CARRIERS
REG. U.S. PAT. OFF.

stations, at the terminal end of 16 miles of principal interceptors, will be protected by mechanically cleaned bar racks. Each station will be equipped —initially—with five vertical motor-driven self-priming sewage pumps, three of which will have auxiliary high-speed diesel engines.

Four smaller pumping stations will be built to lift sewage from low-lying areas into the interceptors.

Treatment plant on Virginia Key, is designed for an average daily flow of 47 mg; maximum flow: 153 mgd.

Provisions for extensions to interceptors, increased pumping facilities, additional treatment capacities and future production of fertilizer have been designed into the system.

Engineers estimate the total cost for the first year of operation, including administration, maintenance, repairs and renewals of the sewage collection and disposal system, at $458,000.

Plans for the entire project were completed in February, 1953, by Miami Sewer Project Assoc., Inc., composed of these three engineering firms: Rader-Knappen-Tippetts, Metcalf & Eddy, and Maurice H. Connell and Assoc., Inc.

Water "giveaway"

Probe reveals discontinuance permits are erroneously named

Philadelphia, Pa., whose city council has been carrying on an investigation of the municipal water department, has uncovered a long-standing municipal "giveaway" of vast amounts of free water to commercial and private users—at a loss that may run to millions of dollars in revenue.

The probe already has produced tangible results. One large-scale user has agreed to repay the city $70,000 in full settlement, while another has offered $12,000.

The story revolves around the issuing of "D" discontinuance permits by the city for shutting off water supply.

• **Discontinuance permits**—Investigation shows that since 1939, an average of 50 "D" permits were issued monthly by the Department of Public Works. In all cases, the city's revenue department stopped billing the property for water service.

But in only eight cases out of 50 was the water actually shut off. In the rest, the water continued to flow into the laterals from the city mains into

the properties, and it was possible for the owners or occupants to continue using city water.

Joseph E. Gold, committee counsel, said he anticipated the city would reap financial benefits of substantial proportions through voluntary disclosures resulting from the hearings. He said that there may be 500 cases per year since 1939 where the water was turned off only for the city records, while supply continued to enter various properties.

Reasons for failure to stop the supply after issuance of permits may have been varied, the committee believes. It is seeking to find out whether it was caused by inefficiency, laziness, the cost of tearing up streets to reach lateral valves or possibly more sinister reasons.

The DPW in former years was supposed to shut off the water. The $1.50 paid for the permit, however, did not begin to cover cost of tearing up paving, shutting off the supply and repairing the pavement. The cost continued to mount as the war period approached, and continues high.

• **Some valid—others?**—Probers found that in many instances the permit was taken out for perfectly valid reasons with no intent to take advantage of the city. Subsequent owners, finding the water turned on, apparently made no effort to learn why they received no bills.

One large hotel in mid-town Philadelphia, according to probers, has paid no charges for water supplied to it through a six-in. main, since it was supposed to have been taken out of service 19 years ago. The hotel's water bill, based on a second four-in. supply line, has averaged approximately $1,500 a year. For 1953 it was $2,250. To add significance to the situation, the hotel is one of the few such establishments in the city that maintain swimming pools.

Industries request annexation

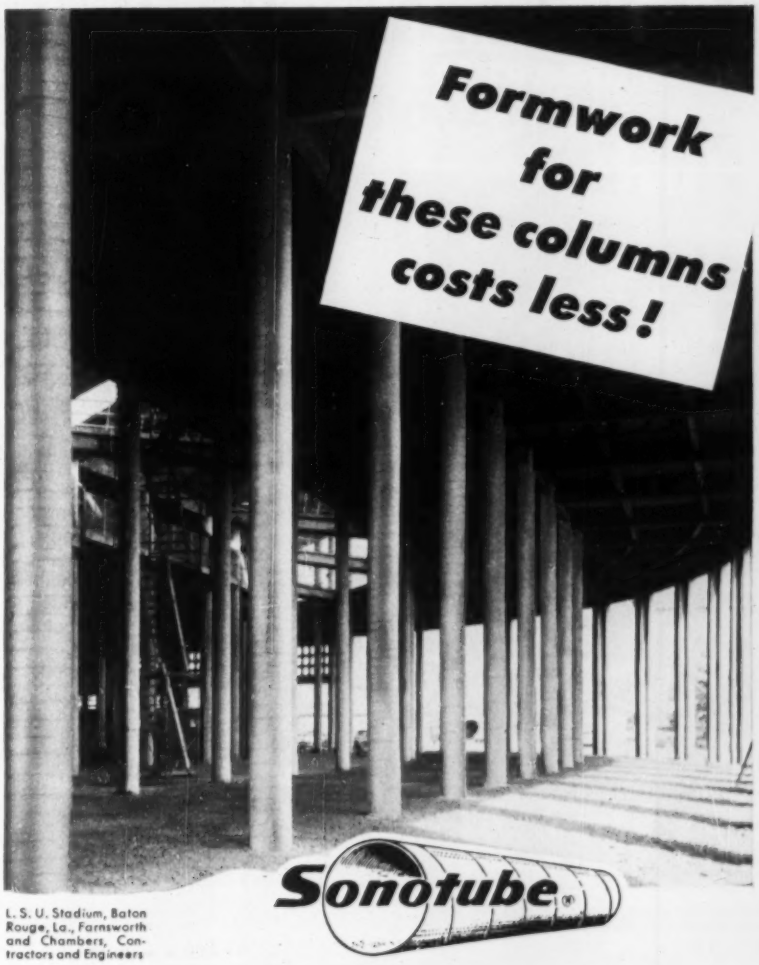
Annexation of fringe areas has become a habit in Shelbyville, Ind., where five factory sites have been annexed, and two are slated for annexation in the near future.

The move will give an additional $1-million property evaluation to the city tax rolls.

All seven of the industries voluntarily petitioned the city council to bring their factories into the corporation limits—a move that means higher taxes.

Most industries have fought at-

(Continued on page 59)



L. S. U. Stadium, Baton Rouge, La., Farnsworth and Chambers, Contractors and Engineers

FIBRE FORMS

for round columns of concrete

Concrete columns supporting the decks of the Louisiana State University stadium were formed with low cost SONOTUBES.

The longest fibre forms used were 35'10" long and 22" I.D., slotted at the top to allow integration of ceiling beams with the concrete columns.

SONOTUBE Fibre Forms save time, money and labor . . . take fewer men to handle because they are lightweight . . . take less time to erect because only minimum bracing is required.

SONOTUBES are supplied in specified lengths up to 50' or can be sawed to your requirements on the job, and in 31 sizes from 1" to 36" I.D.

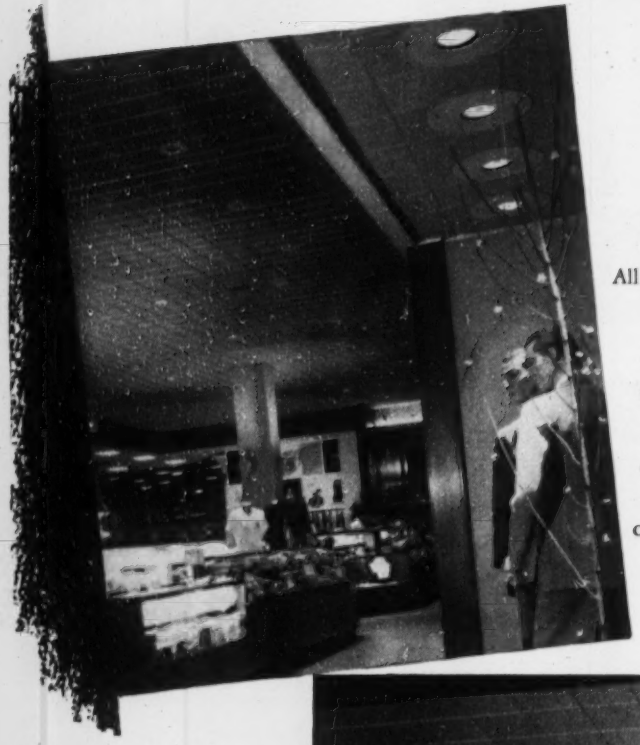
See our catalog in Sweet's

For complete technical data and prices—write

sonoco "PAPER CARRIERS" REG. U.S. PAT. OFF.

SONOCO PRODUCTS COMPANY
Construction Products Division
LOS ANGELES, CAL. — HARTSVILLE, S. C. — MAIN PLANT — MONTCLAIR, N. J.
GARWOOD, N. J. — BRANTFORD, ONT. — AKRON, IND.

J. L. Hudson Co. at New Northland Center Gets Full Sound Conditioning Treatment



As part of an all-inclusive plan to make interiors as inviting and comfortable for shoppers as possible, the J. L. Hudson Company has Acousti-Celotex sound conditioning throughout its new store at NORTHLAND CENTER in Detroit, Michigan.

Functional Beauty

Throughout 350,000 square feet of ceiling area, Acousti-Celotex Random Pattern* Cane Fiber Tile in 25 different color combinations has been installed. All of the tile has a unique multi-colored paint finish which was applied before installation in order to make the ceilings an integral part of overall store design.

Customers, Personnel Benefit

Application of this sound conditioning treatment within the entire store, in all sales areas, offices, beauty salon, stock rooms, employees' lounge, kitchens . . . as well as in the beautiful NORTHLAND Dining Room . . . is intended to benefit both patrons and store staff alike. Shopping and dining may be enjoyed in an atmosphere of quiet comfort. Personnel, too, will find increased ease and efficiency working in these noise-checked areas.

Here again is evidence of the important part Acousti-Celotex sound conditioning is playing in the design of today's new buildings.

Attractive interior views of J. L. Hudson Co., at NORTHLAND CENTER, showing Acousti-Celotex sound conditioned ceilings throughout Women's and Men's Apparel Depts.

Architect: Victor Gruen Associated Architects and Engineers, Inc.
Gen. Contractor: Bryant and Detwiler Company

ACOUSTI-CELOTEX
REGISTERED U. S. PAT. OFF.
TRADE MARK
Sound Conditioning

PRODUCTS FOR EVERY SOUND CONDITIONING PROBLEM
THE CELOTEX CORPORATION, 120 S. LA SALLE ST., CHICAGO 3, ILL.
In Canada, Dominion Sound Equipments, Ltd., Montreal, Quebec

FOR FULL DETAILS on the complete line of Acousti-Celotex products, please write to The Celotex Corporation, Dept. Z-64 120 S. LaSalle Street, Chicago 3, Ill.

*U. S. Pat. No. D-168,763

tempts to annex them on the ground that the higher tax rates in cities is prohibitive.

• **The advantages?**—While the city will provide the industries with sewer service, police and fire protection, the increased tax revenues will facilitate financing construction of a $1.25-million sewage treatment plant next year.

The move will mean better service to the industries and better coordination of public works from the city's standpoint.

The two industries that have requested annexation are the Admiral Corp. and J. L. Chase Corp., according to Mayor Philip H. Banawitz, and the five that already have been taken into the city fold are: Red 73 Creamery, Chambers Corp., Gen Pro Inc., Kennedy Carliner and Bag Co., and Modern Stamping Products, Inc.

A new General Electric Corp. plant, slated for construction on 85 acres of land east of Shelbyville also will be annexed to the city.

Chicago transit head named—formerly commissioner of PW

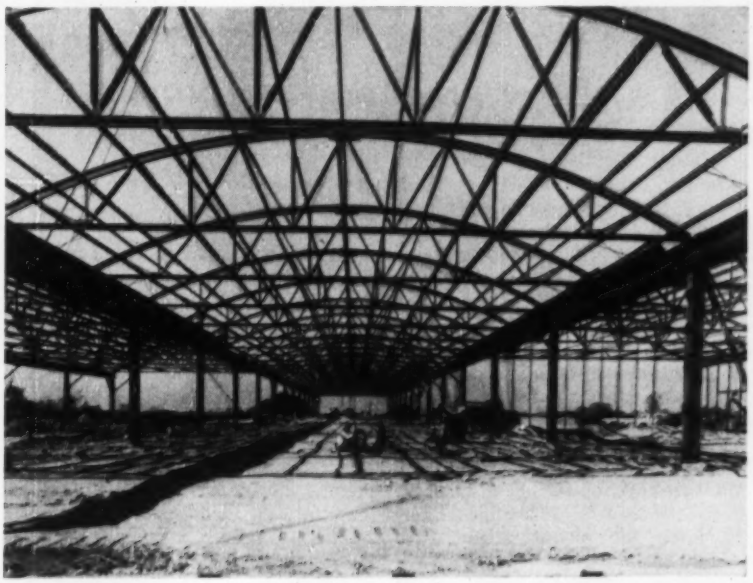
Virgil E. Gunlock, who until this week held the position of Chicago commissioner of public works, has been appointed to membership of the city's transit authority.

He fills the vacancy that was created by the retirement of the chairman of the authority, Ralph Budd. The former chairman is a well-known railroader.

It is generally agreed that Gunlock will be elected to authority chairmanship when the seven-member body conducts an election for the purpose of filling this position.

Gunlock is succeeded as public works chief by his assistant, George L. De Ment who took up the reins as acting commissioner.

The new authority member was a construction engineer on the city's first subway project, and his career continued to rise when he was appointed commissioner of public works in 1945.



Multiple prefabricated steel shopping center—

Meadowbrook Mart, in Bedford, Ohio, a suburb of Cleveland has been constructed by George J. Goudreau, project developer, who calls it a "new type of construction for this purpose, designed to meet a new and unusual concept of modern merchandising."

The steel prefabricated structure, manufactured by Stran-Steel Division of the Great Lakes Steel Corp., will bring more than 100 small "neighborhood storekeepers" under one roof, according to Goudreau.

The building has more than 91,000 sq ft of floor space in the 152 ft x 642 ft area. Three 50-ft bay widths run the length of the building with columns at 32-ft intervals. Girders are of cold formed N-A-X high-tensile steel, saving in costs, and providing unusual flexibility in space and interior construction.

Erection of the building on its 15-acre site started last fall and was accomplished in five months despite bad weather conditions.

LEADING CONTRACTORS USE McCarthy Drills

PUBLIC UTILITY AUGER DRILL

Bores holes from 4½" to 24" in diameter under sidewalks, roads, building foundations, railroad tracks, landscaped grounds, etc. Fithian Contracting Co., Youngstown, O., using McCarthy Public Utility Auger Drills, completes pipe line jobs, formerly taking weeks, in a few days.

SELF-PROPELLED HORIZONTAL AUGER DRILL

Will bore 6" and 8" diameter holes 120 feet horizontally at rate of six feet per minute maximum. Four individual, self-locking jacks maintain correct drilling level. In one day a New Castle, Pa., operator bored holes of various depths totaling 840 ft. through shale and sandstone, using this McCarthy Auger Drill.

VERTICAL AUGER DRILL

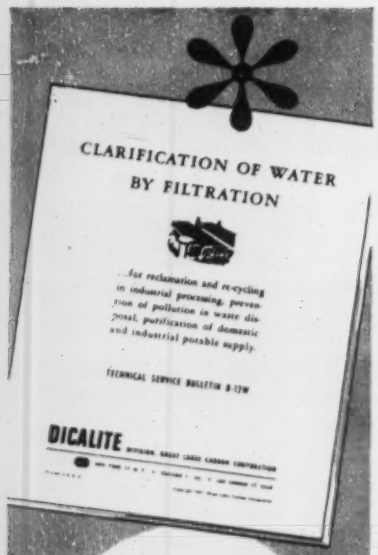
Operating men who have made actual on-the-job tests find the McCarthy Vertical Auger Drill a standout for mobility, stamina, ruggedness and versatility. On a 2-million dollar, 5-mile stretch of superhighway between Hubbard, Ohio, and Sharon, Pa., The Apex Powder Co., Canton, Ohio, cut blasting costs approximately 20% as compared to air, well or churn drilling. Cutting through two large areas of concentrated rock, 150 holes 15 feet deep were bored for each blasting pattern. 3,000 cubic yards of sand rock were moved at each blast. Due to the ruggedness and mobility of McCarthy Drills, there was no time lost. For further information, write Salem Tool Co. and our distributor will contact you.

SALEM

DRILLING EQUIPMENT SINCE 1901

THE SALEM TOOL CO.

1900 S. SOUTH ELLSWORTH AVE.
SALEM, OHIO · U.S.A.



This FREE Bulletin gives valuable data on water filtration...

Many problems in the reclamation or recycling of water in industrial processing, in the prevention of pollution in waste disposal and in the purification of potable supply are answered in DICALITE'S BULLETIN B-12-W—"Clarification of Water by Filtration."

Dependable
Dicalite®
DIATOMACEOUS MATERIALS

Write for your free copy.

DICALITE DIVISION
GREAT LAKES CARBON CORPORATION
Dept. E, 614 S. Flower Street
Los Angeles 17, California

WANETA DAM, on Pend d'Oreille River, south of Trail, B. C., is the fifth and largest—250 ft high, 950 ft long—of a privately owned group of hydro plants near Trail.

Largest of five private hydro projects almost ready to power chemical plants

On the Pend d'Oreille River, just above the point where it runs into the Columbia River south of Trail, B. C., the $35-million Waneta Dam and power plant is nearing completion for the Consolidated Mining and Smelting Co. of Canada, Ltd.

Waneta, largest of the firm's five hydroelectric installations near Trail, will feed power to the company's principal metallurgical and chemical fertilizer plants. Total rated turbine capacity at Waneta is 157,500 kw with two units operating; installation of two more 78,750-kw generators will bring the plant's potential to 315,000 kw.

Creating a 4½-mi-long lake behind it, Waneta Dam is 950 ft long at the crest, 250 ft high over the river bed, and provides a 210-ft head for its turbines. There are nine spillway gates, eight measuring 34x36 ft and one 34x20 ft.

Four 20-ft dia penstock tunnels, 200 ft long, carry water to the power plant. Some 300,000 cfs of water can pass through the plant, 50% more than the greatest flood peak on the Pend d'Oreille.

To tie in the Waneta hydro project with the rest of its system, Cominco built a $2-million transmission system, consisting of three 60-kv lines from Waneta to Trail and a switching station at Trail.

Stone and Webster, Canada, Ltd., was designer and manager for the project, and the prime contractors were Northern Construction and J. Stewart, Ltd., of Vancouver, B. C.

Kuwait sets a new schedule for its development scheme

Under a revised plan for development, the state of Kuwait on the Persian Gulf, will embark on a $390-million program that will take 15 years to complete. During this period the country expects to receive at least $2.4 billion in oil royalties.

Original plans called for a 10-year program costing $364 million. But reportedly because of internal political issues and developments in neighboring Arab states, Kuwait's Sheikh Abdullah Al-Salem Al Sabah decided to cut the pace of construction (ENR June 3, p. 64).

These are the main projects under the new program:

1. A Persian Gulf harbor with four 600-ft-deep anchorages and a 1,200-ft-long landing quay.

(*Continued on page 65*)

Pittsburgh's New

STRUCTURAL STEEL PRIMER

Provides Double Protection For All Kinds Of Structural Steel Shapes

You'll get important two-way protection—and, chances are, save both time and money—when you coat fabricated structural shapes with Pittsburgh's new X-L-O Primer. This unusual product safeguards them against corrosion during transit and erection and reduces risk of surface failures that necessitate premature cleaning and painting.

X-L-O Primer is made with *extracted* linseed oil surpassing Federal specifications. This special oil provides such unusual "wetting" characteristics that surface irregularities caused by mill scale are coated uniformly. This oil also causes such thorough and rapid drying that fabricated shapes can be shipped within 24 hours after coating, in any season.

Besides preventing corrosion in shipment and erection, X-L-O Primer serves as an excellent foundation for field painting. It is available in combination of red lead and iron oxide, or can be supplied with 100% red lead, if desired. Pittsburgh's IRONHIDE or METALHIDE can be used as finishing coats.

For additional information—write, phone or wire Pittsburgh Plate Glass Company, Industrial Sales Division, Gateway Center, Pittsburgh, Pa. Or call the nearest factory listed at the left.

PITTSBURGH PLATE GLASS CO., Industrial Paint Div., Pittsburgh, Pa. Factories: Milwaukee, Wis.; Newark, N.J.; Springdale, Pa.; Atlanta, Ga.; Houston, Texas; Torrance, Calif.; Portland, Ore. Ditzler Color Div., Detroit, Michigan. Thresher Paint & Varnish Division, Dayton, Ohio. Forbes Finishes Division, Cleveland, Ohio. M. B. Suydam Div., Pittsburgh, Pa.

PITTSBURGH PAINTS

PAINTS • GLASS • CHEMICALS • BRUSHES • PLASTICS • PURE GLASS

PITTSBURGH PLATE GLASS COMPANY

IN CANADA: CANADIAN PITTSBURGH INDUSTRIES LIMITED

"Electronic Politeness"

OTIS ELECTRONIC ELEVATOR DOORS

that can't be matched

DRAMATIZE OTIS ELECTRONIC LEADERSHIP

The Otis Electronic Door is the crowning achievement in the field of the Operatorless Elevator. Its unmatched "electronic politeness" is available only with AUTOTRONIC elevators. The successful development of this door insured the ability of operatorless elevators to move great masses of people in busy buildings with the greatest degree of safety.

Only AUTOTRONIC elevators have car and hoistway doors with an *electronic zone of detection*. It is a proximity zone that extends in front of the leading edges of both the car and hoistway doors up to shoulder height. Naturally, it is invisible to the passengers. (See phantom drawing at the left.)

No time is lost. The doors close promptly after each stop. If the *electronic zone* detects a person's presence, the doors politely reverse *—even before they can touch the passenger*. But if there is no chance of passenger interference, the doors continue to close without unnecessary car delay.

This *zone of detection* politely helps to prevent passengers from delaying the elevator, too. If a talkative passenger lingers overlong in the doorway, a buzzer sounds and the doors slowly, firmly—but politely nudge the passenger out of the doorway so the car can proceed on its way.

And most important from a building manager's viewpoint, this *zone of detection* is on duty all of the time the elevators are in operation. Its electronic reflexes never tire or slow down. It is a most vital point of AUTOTRONIC elevatoring. Its unmatched superiority makes possible uniformly fast, regular service in Otis automatic passenger elevators.

Otis AUTOTRONIC elevatoring saves up to $7,000 a car, each year. It is suitable for office buildings, hotels, hospitals, banks, and department stores. Visit a new or modernized installation. Ask any of our 268 offices for details.

• • •

Otis Elevator Company
260 11th Ave., New York 1, N. Y.

COMPLETELY AUTOMATIC

AUTOTRONIC®

ELEVATORING

If you're interested in water works,

...let us send you a copy of this booklet which tells how new Ring-Tite Coupling cuts costs

WHETHER you're engineer, contractor or water works official, whether you're responsible for selection, installation or operation of water lines, here is a booklet that can show you the way to save money. It tells about the many outstanding features of the new Ring-Tite® Coupling; how water line assembly time is saved every step of the way; how it saves at valves, hydrants and fittings; how it pairs up with Transite® Pressure Pipe, the asbestos-cement product, that has set the pace for performance in water line service.

Get your copy today . . . write for Brochure TR-142A, Johns-Manville, Box 60, New York 16, N. Y.

JOHNS-MANVILLE JM PRODUCTS

Johns-Manville TRANSITE PRESSURE PIPE

WITH NEW RING-TITE COUPLING

2. A pipeline to bring fresh water from Iraq's Shatt El Arab River. Kuwait will then produce its own potable water and widen its agricultural efforts.

3. An electric power plant with a generating capacity of 70,000 kw. A section of the plant to be capable of developing 30,000 kw is now under construction.

4. Roads. Kuwait now has around 9,000 cars—but only 60 miles of hard-surface roads.

5. An airport with up-to-date equipment to cope with increasing air traffic.

6. A residential quarter at the edge of the old city of Kuwait. It will include 1,000 units capable of housing 45,000 people.

Israel has $½-billion plan for Middle East irrigation

Israel has submitted a $500-million plan to the U. S. for harnessing three Middle East rivers to irrigate farmland in Israel and also in three neighboring Arab states.

The plan calls for development of the Jordan, Litani and Yarmouk rivers, which run through Jordan, Syria and Lebanon as well as Israel. Cost of the program—about $20 million a year for 25 years—would be shared by the four basin states.

Eric Johnston, President Eisenhower's special envoy, is scheduled to leave Washington this month for water development talks with Israeli and Arab government leaders.

International briefs . . .

• **Road route chosen**—British Columbia's Vancouver-to-Squamish scenic highway—scheduled to be under construction by this summer—will be routed around Howe Sound instead of through Capilano Valley. Reason: the valley route through the watershed might endanger drinking water facilities of the lower mainland. The 30-mi road—a two-year job estimated to cost $8-$10 million—will run parallel with the planned Pacific Great Eastern Rail Line extension, opening up timber and agricultural areas in Pemberton Valley.

• **TV relay system**—Construction of 45 television relay stations and towers will start early next year along a 1,200-mi Northern Ontario route between Toronto and Winnipeg, Man. Estimated cost: $5 million. Most of the route will be through sparsely inhabited bush country north of Lake Superior. At present the Bell Telephone Co. of Canada is testing the

(Continued on page 66)

NOW there's an ESCO DOZER ROOTER®

to fit all makes and models of dozers and angledozers...

Models 38 and 42 fit all dozers and angledozers with blade heights from 38 in. through 50 in.

...make your tractor a powerful rooter, in minutes

Now there's an *ESCO* Dozer Rooter to add tremendous ripping power to any dozer or angledozer.

Put one on your tractor and watch it rip and root its way through concrete, asphalt, lava rock, hardpan, boulders. An *ESCO* Dozer Rooter outperforms a cumbersome drawbar ripper. Yet, it's portable enough to carry on the tractor or in a pickup truck from job to job.

The Dozer Rooter rips in front of the dozer—punching out its own road on pioneering jobs. Gives tractor maneuverability for close-in work on narrow city streets. Adjusts easily to the proper rooting depth. Permits safe operation around pipes and cables.

Operators say that the Dozer Rooter does two hours work in ten minutes. Put one or more on your operation today. See your *ESCO*® dealer, or write for details to Electric Steel Foundry Co., 2142 N. W. 25th Avenue, Portland 10, Oregon.

Models 26 and 32 fit all dozers and angledozers with blade heights from 26 in. through 37 in.

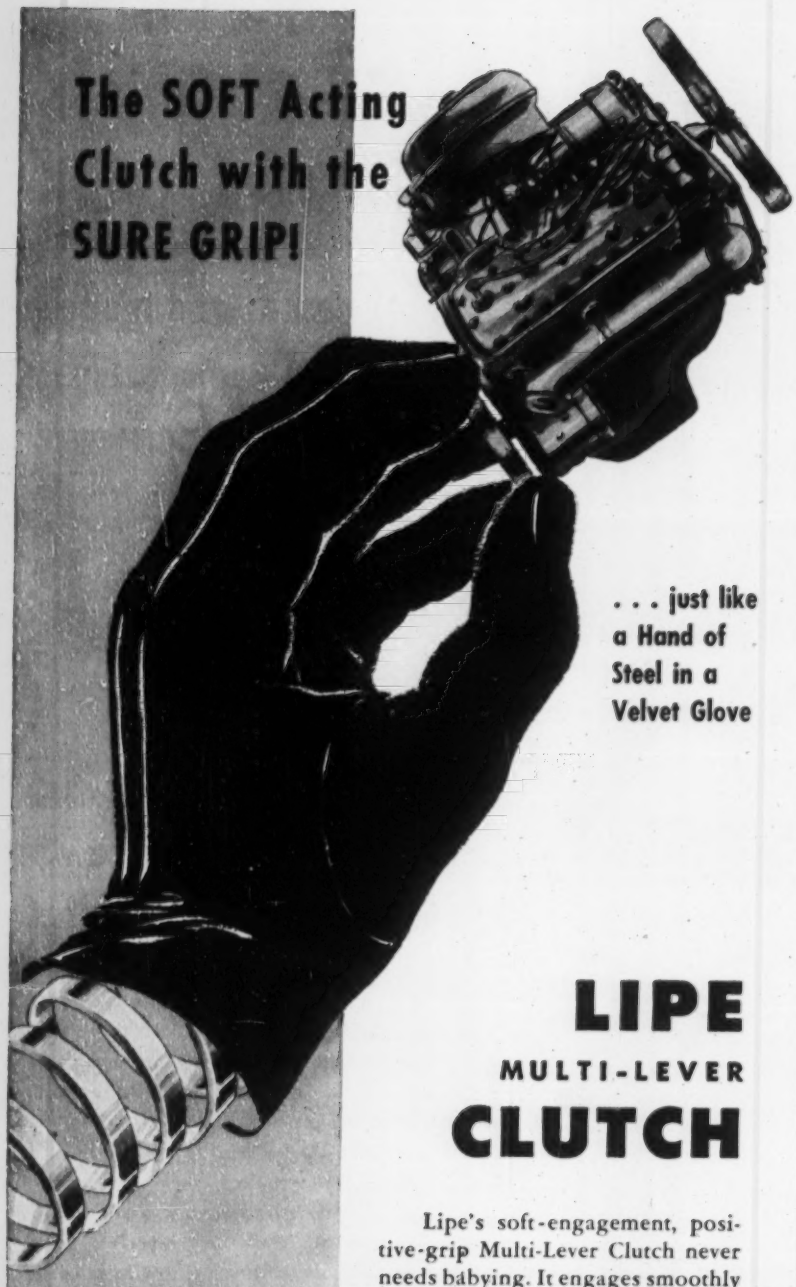
ESCO

Offices and Warehouses: Honolulu, Hawaii; Houston, Texas; New York, New York; Los Angeles, San Francisco, California; Seattle, Spokane, Washington; Centralia, Pennsylvania; Eugene, Medford, Oregon; Salt Lake City, Utah. In Canada: Vancouver, B. C., and Toronto, Ontario.

ELECTRIC STEEL FOUNDRY CO.

2142 N. W. 25TH AVE., PORTLAND 10, ORE. 712 PORTER ST., DANVILLE, ILL.

The SOFT Acting Clutch with the SURE GRIP!

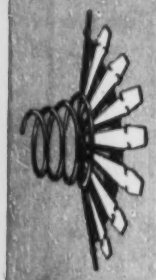


. . . just like a Hand of Steel in a Velvet Glove

LIPE
MULTI-LEVER
CLUTCH

Lipe's soft-engagement, positive-grip Multi-Lever Clutch never needs babying. It engages smoothly—without grab, shock or jerk. All parts of the pressure plate touch at the *same instant* with the *same* pressure. There's no cocking—no point of high slippage and spot burning. Result: *More mileage between teardowns.*

For quick service on Genuine Lipe parts look under "Clutches" in the yellow pages of your phone book.



The hand of steel in the Lipe Clutch has 20 fingers that equalize the pressure of a single spring—assuring softer engagement and a positive grip.

Lipe-ROLLWAY CORPORATION
Manufacturers of Automotive Clutches and Machine Tools
Syracuse 1, N. Y.

INTERNATIONAL

microwave relay path with temporary facilities.

• **Lebanon hydro plant**—A group of German companies has offered to finance and construct a $30.8-million hydroelectric plant on the Litani—Lebanon's most important river. Meanwhile, a Point Four aid plan for the project is under study and is expected to be submitted to the Lebanese government this month.

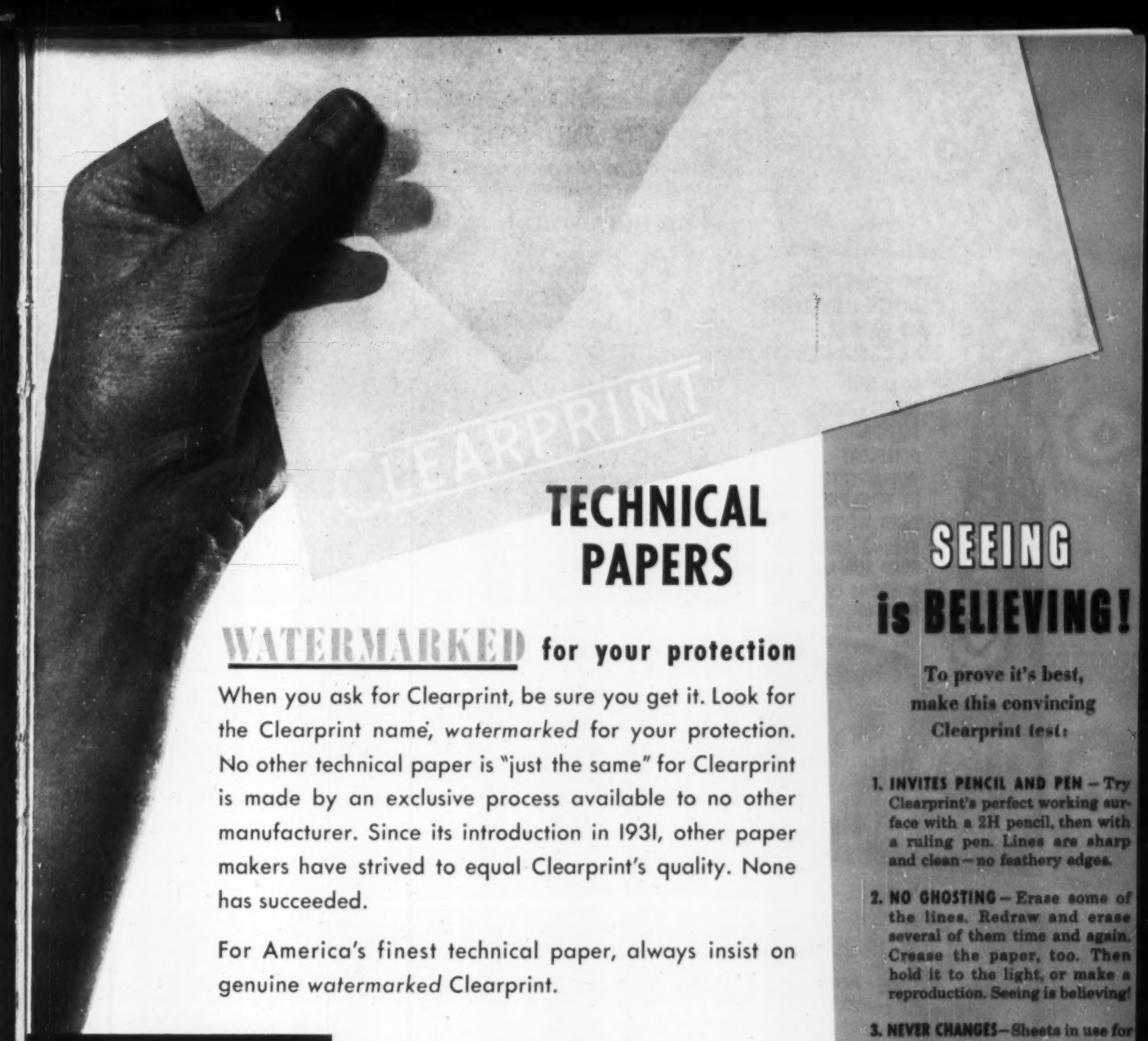
• **Santiago subway**—Chile's Ministry of Public Works and Communications will call for bids this month on construction of a subway in Santiago. The project, which is estimated to require two years for construction, will cost about $14 million.

• **France seeks U. S. bids**—The French government has invited U. S. firms to bid on construction of a number of petroleum projects included in a NATO program. Jobs involve supplying pipe, building storage depots, installing pipelines and furnishing motors and pumps for the French petroleum system.

• **Pakistan pipeline funds**—The International Bank for Reconstruction and Development will loan Pakistan $14 million toward construction of a $25.2-million gas pipeline from the Sui gas reservoir to Karachi. The 350-mi route will run through the lower Indus Valley, by way of Sukkur and Hyderabad, and is expected to supply most of Pakistan's industrial fuel needs. Construction should be completed by next May. The line will carry 37-million cu ft of gas a day in 1955 but volume will increase gradually to a daily rate of 110-million cu ft.

• **Reviving Philippine roads**—President Ramon Magsaysay has ordered an immediate start on the Philippine $100-million highway improvement program. Plans call for concrete paving of important roads and construction of bridges for major river crossings throughout the country. The five-year program will be financed from funds resulting from the sale of a $500-million bond issue.

• **Principal power plant**—Norway plans to build its largest hydroelectric plant (capacity 515,000 kw) plus three other facilities in the Swedish-Norwegian border area of Rana. One of the new plants will be located in Swedish territory, and since Sweden will import much of the power from the four facilities, there will be a joint regulation of river water withdrawal.



TECHNICAL PAPERS

WATERMARKED for your protection

When you ask for Clearprint, be sure you get it. Look for the Clearprint name, *watermarked* for your protection. No other technical paper is "just the same" for Clearprint is made by an exclusive process available to no other manufacturer. Since its introduction in 1931, other paper makers have strived to equal Clearprint's quality. None has succeeded.

For America's finest technical paper, always insist on genuine *watermarked* Clearprint.

SEEING is BELIEVING!

To prove it's best, make this convincing Clearprint test:

1. **INVITES PENCIL AND PEN** – Try Clearprint's perfect working surface with a 2H pencil, then with a ruling pen. Lines are sharp and clean – no feathery edges.
2. **NO GHOSTING** – Erase some of the lines. Redraw and erase several of them time and again. Crease the paper, too. Then hold it to the light, or make a reproduction. Seeing is believing!
3. **NEVER CHANGES** – Sheets in use for over 20 years prove Clearprint's amazing stability. Its strength, transparency and printing qualities remain unchanged after extended exposure to age, atmosphere, heat and light.

If you are not using Clearprint now, please make this comparative test on the paper you are using.

CLEARPRINT®

TECHNICAL PAPER

THERE IS NO SUBSTITUTE – Demand Watermarked Clearprint

There are Clearprint Technical Papers for every requirement.

Order from your dealer today, or write:

CLEARPRINT PAPER CO.
1482 SIXTY-SEVENTH STREET
EMERYVILLE, CALIFORNIA

MAIL COUPON FOR SAMPLES AND PRICES

CLEARPRINT PAPER CO. 1482-67TH STREET, EMERYVILLE, CALIF.

☐ Send me Clearprint samples, with prices, for the following uses:

_____

_____

☐ Have your representative call at my office.

NAME _____

FIRM _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

BRIDGING THE COUNTRY

THE SUPERIOR BRIDGE DECKING FOR SMALL OR LARGE JOBS

★ 80% OPEN
★ SELF-CLEANING
★ SELF-DRAINING
★ NON-FLOAT
★ NOT AFFECTED BY WIND PRESSURE
★ LIGHT WEIGHT
★ STRONG, SAFE ROAD SURFACE
★ MINIMUM OF ROAD MAINTENANCE

IRVING DECKING

"A BRIDGE IS ONLY AS GOOD AS ITS DECK"

- Also gratings for bridge sidewalks and gutter catch basins.
- No accumulation of dirt or snow.
- For further information and engineering data ask for catalog.

IRVING SUBWAY GRATING CO., INC.
ESTABLISHED 1902

OFFICES and PLANTS at
5063 27th St., Long Island City 1, N. Y.
1863 10th St., Oakland 20, California

The man who finds water for New Yorkers

Irving Huie must satisfy world's biggest thirst—a job he really enjoys

Arthur J. Fox, Jr.
Associate Editor

IRVING V. A. HUIE—water supplier.

Irving Van Arnam Huie was happy as a child with a new toy last week. As engineer-president of the engineering organization charged with finding and developing new water supplies for New York City, he had just been handed a new source of 360 mgd (ENR June 10, p. 24).

To a man who is responsible for supplying water to eight million people who have recently suffered through two years of serious water shortage (1949-50) this approval came as an answer to a prayer—a prayer plus years of hard work and aggravation.

It came in the form of a decision by the U. S. Supreme Court raising limits previously imposed on diversions by New York from the interstate Delaware River. And it meant that "Maj" Huie's big engineering organization could go to work immediately on its planned third-stage development of the Delaware River—$140 million worth of tunnel, dam and related construction.

• **Heads unique agency**—The Board of Water Supply that Irving Huie heads—entering its 50th year—is an unusual organization. Separate and distinct from the city's Department of Water Supply, Gas and Electricity, which operates all water facilities, it is an engineering organization set up solely for the purpose of developing new supplies. On completion, the operation, maintenance and distribution of these supplies is up to the Department of Water Supply, Gas and Electricity.

Water supply is a big problem in the nation's biggest city. Even before consolidation of the Greater City of New York in 1898, continuing growth of water demand was foreseen. Foresight of the city fathers around the turn of the century put such capable engineers as John R. Freeman, William H. Burr and Rudolph Hering to planning additional supplies even before final development of the Croton watershed north of the city—started in 1842—was completed. It was they who first put thumbs down on filtering Hudson River water and who recommended going to relatively pure streams in the Catskill Mountains west of the river.

Their Catskill recommendation was a long-range project, not to be completed over night. Continuity of responsibility and control was desired.

In 1905, Governor Frank W. Higgins told the New York State Legislature: "Extension of the present (supplies) cannot much longer be carried on piecemeal. . . . A continuous body, composed of able and interested men, selected without reference to political affiliation, alone can deal adequately with the water question."

The state legislature that year created by law the New York City Board of Water Supply. The city has since staffed it and financed its projects.

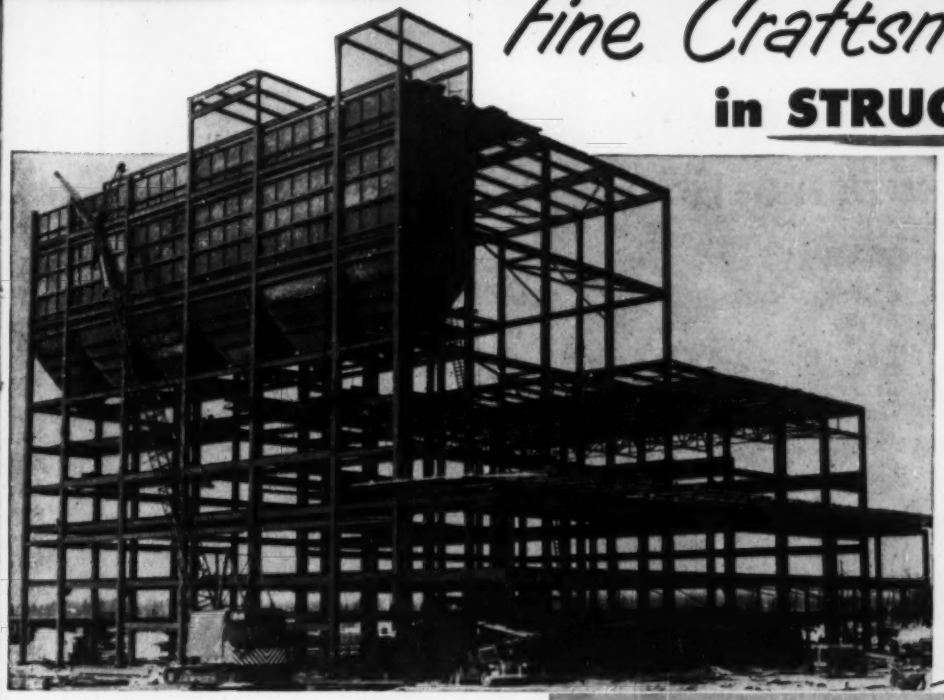
• **Has a continuing problem**—First contract for construction on the Catskill system was let by BWS in 1907 and first delivery of Catskill water through the aqueduct started in 1915. Construction of additional steel pipe siphons finished the aqueduct in 1925; impounding in Schoharie Reservoir started in 1926, completed the full development after 19 years.

Meanwhile, the city grew; and in 1921, J. Waldo Smith, chief engineer of BWS, put his staff to studying all possible further sources of supply within a 200-mile range. They settled on the Delaware River headwaters and Rondout Creek, because of the pure, soft water and gravity delivery.

There followed the well-known Supreme Court action, New Jersey's injunction disputing New York's right to divert water from the Delaware watershed. The 1931 court decree granted New York the right to 440 mgd.

(Continued on page 72)

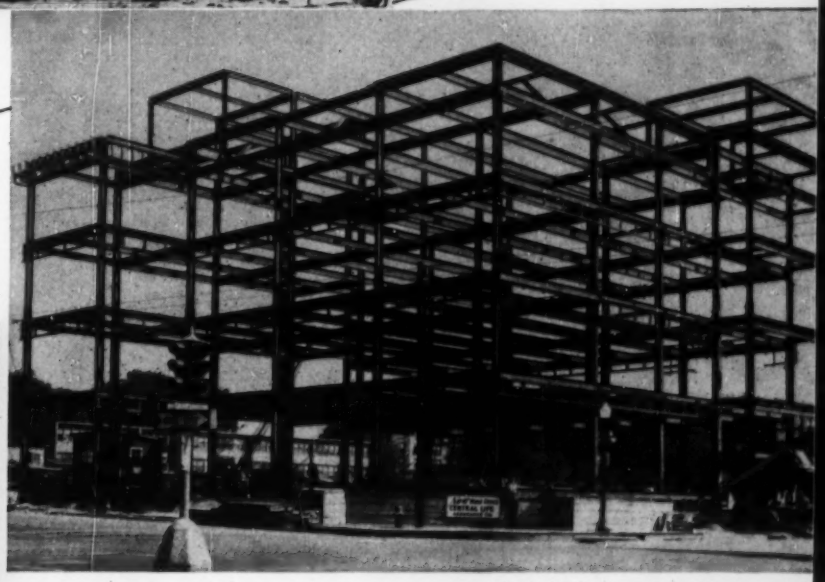
Fine Craftsmanship in STRUCTURAL STEEL



for a wide range of industrial and commercial requirements—

Coast to Coast...

Municipal Power Plant
Richmond, Ind.



Central Life Assurance Co.
Des Moines, Ia.

by

PITTSBURGH •DES MOINES

From power plants to office buildings, Pittsburgh-Des Moines' specialized structural steel experience offers better value—in design, in fabrication, and in carefully-supervised erection. Three completely-equipped structural shops are strategically located for prompt service. • Write, phone or wire for consultation.

PITTSBURGH•DES MOINES STEEL CO.

Plants at PITTSBURGH, DES MOINES and SANTA CLARA

Sales Offices at:

PITTSBURGH (25).....3414 Neville Island
NEWARK (2)...216 Industrial Office Bldg.
CHICAGO (3), 1218 First National Bank Bldg.
LOS ANGELES (48).....6399 Wilshire Blvd.
DES MOINES (8), 915 Tuttle Street
DALLAS (1), 1219 Praetorian Bldg.
SEATTLE.....522 Lane Street
SANTA CLARA, CAL., 621 Alviso Road

Great new power to speed construction jobs

New 2-tonners with all-new "Jobmaster 261" engine* make light work of heavy hauling . . . save you time every trip

Here's Chevrolet's newest and most powerful answer to your construction hauling needs. New 2-ton Chevrolet trucks have what it takes to speed up your schedules and bring down your costs on big load off-the-road operations.

NEW POWER FOR TOUGH JOBS

You can call on extra reserves of high compression power that takes steep grades and rough terrain in its stride. In fact, the all-new "Jobmaster 261" engine* is the most powerful Chevrolet truck engine ever built. And it delivers increased operating economy besides! That's because it reduces the need for shifting into the low gears on grades and in traffic.

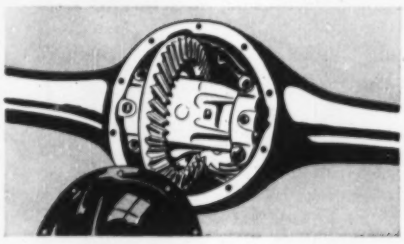
NEW SPACE FOR BIG LOADS

Spacious new Chevrolet stake and platform bo[illegible] permit you to haul wider, longer loads. N[illegible]rolet pickups also bring you increased l[illegible] spac[illegible]. These bodies are built to take it—[illegible] keep coming back for more!

Why not stop in and get the whole money-saving Chevrolet truck story at your Chevrolet dealer's soon! . . . Chevrolet Division of General Motors, Detroit 2, Michigan.

CHEVROLET ADVANCE-DESIGN TRUCKS

NEW CHEVROLET TRUCKS



New, stronger rear axle

Larger axle shafts in 2-ton models provide increased durability that pays off on construction jobs.

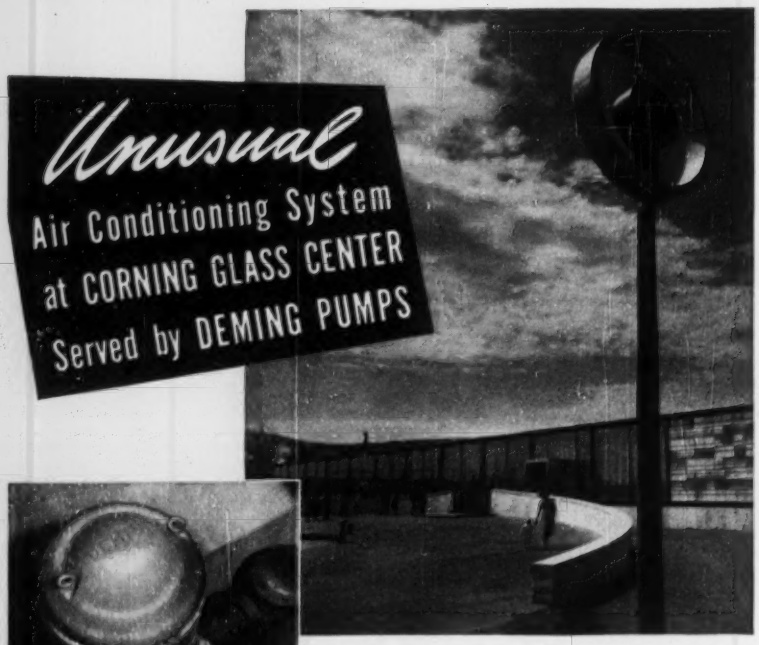
New Comfortmaster cab

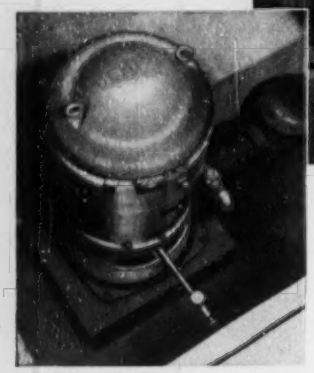
New one-piece curved windshield increases visibility. New instrument panel is easier to read and reach.

MOST TRUSTWORTHY TRUCKS ON ANY JOB!

Plus all these Advance-Design truck features: **THREE GREAT ENGINES**—The new "Jobmaster 261" engine* for extra-heavy hauling. The "Thriftmaster 235" or "Loadmaster 235" for light-, medium- and heavy-duty hauling. **SYNCHRO-MESH TRANSMISSION—DIAPHRAGM SPRING CLUTCH—HYPOID REAR AXLE—TWIN-ACTION REAR WHEEL BRAKES** on heavy-duty models. **DUAL-SHOE PARKING BRAKE** on heavy-duty models. **NEW RIDE CONTROL SEAT*—NEW, ROOMIER PICKUP, STAKE AND PLATFORM BODIES—NEW COMFORTMASTER CAB—PANORAMIC WINDSHIELD—BALL GEAR STEERING—NEW ADVANCE-DESIGN STYLING.**

**Optional at extra cost. Ride Control Seat is available in standard cabs only. "Jobmaster 261" engine on 2-ton models.*





Above view shows main entrance of the Corning Glass Center, established in 1951 by the Corning Glass Works at Corning, N. Y.

View at left shows the Deming Vertical Turbine Pump which serves the versatile air conditioning system at the Corning Glass Center.

Dedicated to the history, art and science of glass-making, the Corning Glass Center at Corning, N. Y., has been visited by more than a million people since its official opening in 1951. Maintaining proper temperatures throughout its multiple units requires an extremely versatile and flexible system of air conditioning. Cooling loads are unusually high and variable due to the glass walls, absence of shade, and constantly changing numbers of people in the numerous units of the Center.

A Deming Vertical Turbine Pump supplies water from a 100-foot well to the condensers. A system of chilled water circulated to conditioning equipment for each area or group of areas is used. Loads total approximately 300 tons and require circulation of an aggregate of approximately 100,000 CFM of conditioned air.

For complete information about the applications of Deming Vertical Turbine Pumps in air conditioning systems and for many other uses, write for Bulletin 4700.

THE DEMING COMPANY
536 Broadway • Salem, Ohio

Deming
VERTICAL TURBINE PUMPS

MEN AND JOBS

Delaware project stages one and two commenced finally in 1936 when the brakes of depression were released. By the start of World War II, which completely halted progress, BWS had finished (but not equipped) the 85-mile, $164-million Delaware Aqueduct—world's longest tunnel.

When Irving Huie was named president of BWS in 1945, postwar construction had not yet started. Water users numbered more than 7.5 million, and a billion gallons a day was not enough. While court action, depression and war were playing havoc with development of new supplies, the city's consumption was increasing at the rate of about 50 mgd each year.

• **Calls for continued construction**—Commissioner Huie's problem since 1945 has been, in his words, "to get the city ahead of the eight-ball" on water supply. In the effort, his BWS has spent about $10 million a year on three reservoirs and 31 miles of tunnel designed to boost total dependable supply to 1,460 mgd by 1956.

The eight-ball keeps rolling. It is estimated that by 1965, demand will equal the dependable supply. But with the 360 mgd just made available by Supreme Court action, BWS is now set up to build stage 3 of its Delaware project, on the West Branch of the Delaware. With the proposed reservoir near Cannonsville, the city will have increased its dependable supply to 1,820 mgd. BWS estimates this to be enough water to meet the city's needs until about 1992.

• **And continued agitation**—Commissioner Huie's job is to sell engineering projects today designed to meet needs many years hence; then get them completed in time. The selling is the tougher part. In the case of this reservoir to be built at Cannonsville, the city's Board of Estimate was convinced away back in 1950; then New York State's Water Power and Control Commission was sold; and it took until now to get approval of the Supreme Court.

In the last four years of carrying its case forward, BWS repeatedly has had to defend its position on upland waters. This position traditionally has been that New Yorkers don't want to drink treated Hudson River water as long as there are unpolluted upland sources to be developed. And so far, BWS estimates have shown that while the distant supplies have higher first cost, they are cheaper in ultimate cost than pumping and filtering the Hudson's waters.

(*Continued on page 74*)

DOUBLE-TIGHT!

Dresser Couplings Solve Expansion and Contraction

Expansion and contraction of this concrete storm sewage tunnel —in Cleveland's Morgan Run Project—did not rule out the feasibility of using the tunnel to carry two 16″ overhead sanitary sewage lines. Using Dresser Style 38 Couplings, each joint in the 860 feet of line accommodates ⅜″ longitudinal pipe movement . . . *yet remains absolutely bottle-tight.*

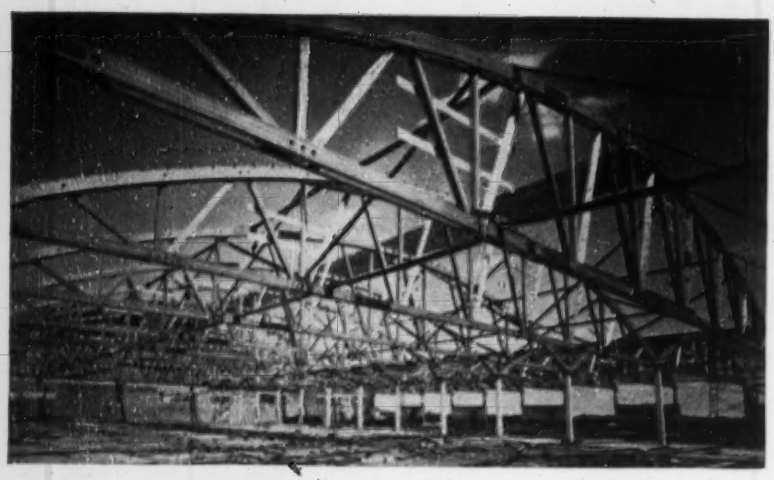
. . . Permit Pipe Deflections

Resilient gaskets in the Dresser Couplings—safely permitting pipe deflections up to 3°— eliminated many alignment problems and greatly facilitated installation.

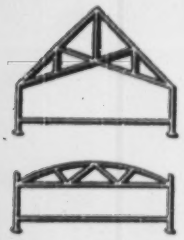
For information on the many other ways Dresser Couplings can help you get a superior job on your sewage and industrial waste projects, contact your local piping supply house or write us.

DRESSER® **COUPLINGS**

Dresser Manufacturing Division, 69 Fisher Ave., Bradford, Pa. (One of the Dresser Industries). Warehouses: 1121 Rothwell St., Houston; 101 S. Airport Blvd., S. San Francisco. Sales offices also in: New York, Philadelphia, Chicago, Toronto.



Rilco Laminated Products, Inc., fabricated 120' and 80' span trusses with TECO connectors for its Albert Lea, Minn., plant.



Timber is plentiful . . . and timber design data* are available for light and heavy construction

PLAN IN TIMBER

with TECO WEDGE-FIT connectors and TRIP-L-GRIP framing anchors for stronger construction of . . .

SCHOOLS	HANGARS
CHURCHES	RECREATIONAL,
STORES	COMMERCIAL
GARAGES	and INDUSTRIAL
WAREHOUSES	BUILDINGS

Timber fabricators in all areas are supplying prefabricated ready-to-erect timber trusses and framing members for many types of construction.

*TIMBER DESIGN DATA that will help you design and specify timber construction is contained in the "TECO Design Manual for TECO Timber Connector Construction." Use the coupon or your letterhead to obtain your

Free Copy Today

TIMBER ENGINEERING COMPANY 1319 18th Street, N.W., Washington 6, D.C.
CHICAGO • NEW ORLEANS • IN CANADA: J. E. GOODMAN SALES, LTD., TORONTO

Please send FREE copy of "TECO Design Manual for TECO Timber Connector Construction."

Name .....
Firm .....
Street .....
City ..... Zone ..... State .....

ENR-548

MEN AND JOBS

In water-short 1950, BWS was induced to build a 100-mgd emergency pumping plant on the Hudson. It has been kept ready to respond to call but has never been used—may never be.

In 1951, a report by Thorndike Saville, W. W. Horner, Louis R. Howson and Abel Wolman advised New York to tap and treat the Hudson River rather than develop Cannonsville reservoir. Irving Huie contested cost figures estimated in the report of this panel of recognized experts and stuck by his own engineers' claim that in the long run higher quality, greater dependability and economics still favor the upland source. The city administration upheld Huie and filed the consultant's report.

With about 10 years of construction behind him, and now a 15-year project ahead, Irving Huie has responsibility for completing the development of more water supply than all his predecessors in BWS since 1905.

His experience for the job was built up through a series of administrative positions. He was Commissioner of New York City's Department of Public Works from 1938 to 1945; member of the City Planning Commission 1942-45; Deputy Commissioner of Highways for New York State in 1918-19; a major in the 1st U. S. Engineers in 1917-18. And in some 18 years of private engineering practice, he worked with Frederick Stuart Greene, David Schoentag, Inc., and Madigan-Hyland between 1920 and 1938.

Born in Brooklyn, educated at NYU (BS in CE, '11), Irving Huie is a native New Yorker. It was New York's late Mayor Fiorello LaGuardia who put him in public service in 1938 and who appointed him Commissioner of the BWS in 1945. The three commissioners of the board are appointed by the mayor for indefinite terms.

Chief engineer of BWS is Karl R. Kennison, water supply engineer of note who distinguished himself a few years back by resigning as chief engineer of the construction division of Boston's Metropolitan District Commission in protest over political pressures. He and Henry Z. Pratt, Jr., deputy chief engineer for research and development, have spearheaded the recent drive of the board's engineering forces in the Supreme Court case. Stanley M. Dore and LeRoy Hammond are deputy chief engineers, respectively, for design and construction; now they will devote themselves to making Cannonsville a reality.

BWS forces now number about 640, of which 370 are engineers, the balance being administrative and clerical forces, police and gatekeepers.

TONCAN SECTIONAL PLATE ARCH-PIPE

for full capacity flow—where headroom is low

The low, wide arch lets Toncan Sectional Plate Arch-Pipe carry a large volume of water, fast. Yet, it fits in where the fill must be kept low—where limited headroom restricts the size of full round pipe.

Like other Toncan Drainage Structures, Sectional Plate Arch-Pipe is easily installed in any weather with unskilled labor. Lightweight, pre-formed, pre-punched sections reduce shipping, handling and installation costs. A single order covers all needed materials—including specially designed bolts, nuts and washers.

Because Toncan Sectional Plate Arch-Pipe is strong and flexible, it is unaffected by impact, vibration, shifting soils or severe weather changes. And, it offers the highest rust-resistance of any ferrous metal in its price class.

One of the Toncan Drainage Products Manufacturers listed below can give you "specs" and engineering data on all types of Toncan Drainage Products. Or write to:

REPUBLIC STEEL CORPORATION
GENERAL OFFICES • CLEVELAND 1, OHIO
Export Department: Chrysler Building, New York 17, N. Y.

Toncan Drainage Products are made from Republic Toncan Iron and Republic Copper Steel

Corrugated Metal Pipe • Perforated Corrugated Metal Pipe • Sectional Plate Pipe • Sectional Plate Arches • Corrugated Metal Arch-Pipe • Sectional Plate Arch-Pipe • CorWel Subdrainage Pipe • Asphalt Coated Pipe • Asphalt Coated and Paved Pipe.

Manufacturers of Toncan Drainage Products

BEALL PIPE & TANK CORPORATION
PORTLAND, ORE.
BOISE, IDAHO

BERGER METAL CULVERT CO., INC.
WESTMINSTER STATION, VERMONT

THE BOARDMAN CO.
OKLAHOMA CITY, OKLA.
TULSA, OKLA.

BLUEGRASS PIPE & CULVERT CO.
LOUISVILLE, KY.

CENTRAL CULVERT CORPORATION
ALEXANDRIA, LA.

CHOCTAW, INC.
MEMPHIS, TENN.

DOMINION CULVERT & METAL CORP.
ROANOKE, VA.

EATON METAL PRODUCTS CORP.
OMAHA, NEB.
HUTCHINSON, KAN.

EATON METAL PRODUCTS COMPANY
BILLINGS, MONT.

EMPIRE STATE CULVERT CORP.
GROTON, N. Y.

ILLINOIS CULVERT & TANK CO.
PEORIA, ILL.

JENSEN BRIDGE & SUPPLY COMPANY
SANDUSKY, MICH.

H. V. JOHNSTON CULVERT CO.
MINNEAPOLIS, MINN.
ABERDEEN, S. DAK.

LOGANSPORT METAL CULVERT CO.
LOGANSPORT, IND.

M & M HIWAY MATERIALS CO.
COLUMBIA, MO.

NORTH DAKOTA METAL CULVERT CO.
FARGO, N. DAK.

REPUBLIC STEEL CORPORATION
Culvert Division
CANTON, OHIO
PHILADELPHIA, PA.

THOMPSON PIPE & STEEL COMPANY
DENVER, COLO.

TRI-STATE CULVERT & MFG. CO.
TAMPA, FLA.
DECATUR, GA.

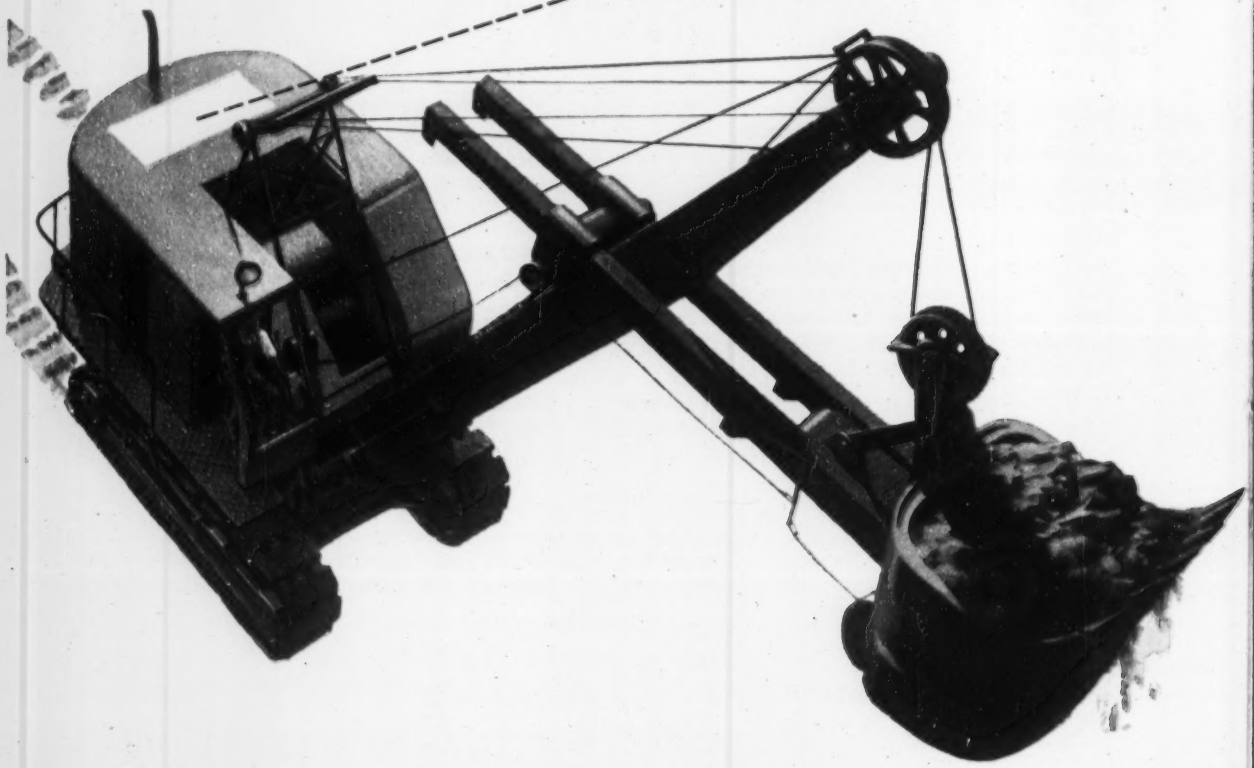
UTAH CULVERT COMPANY
OGDEN, UTAH

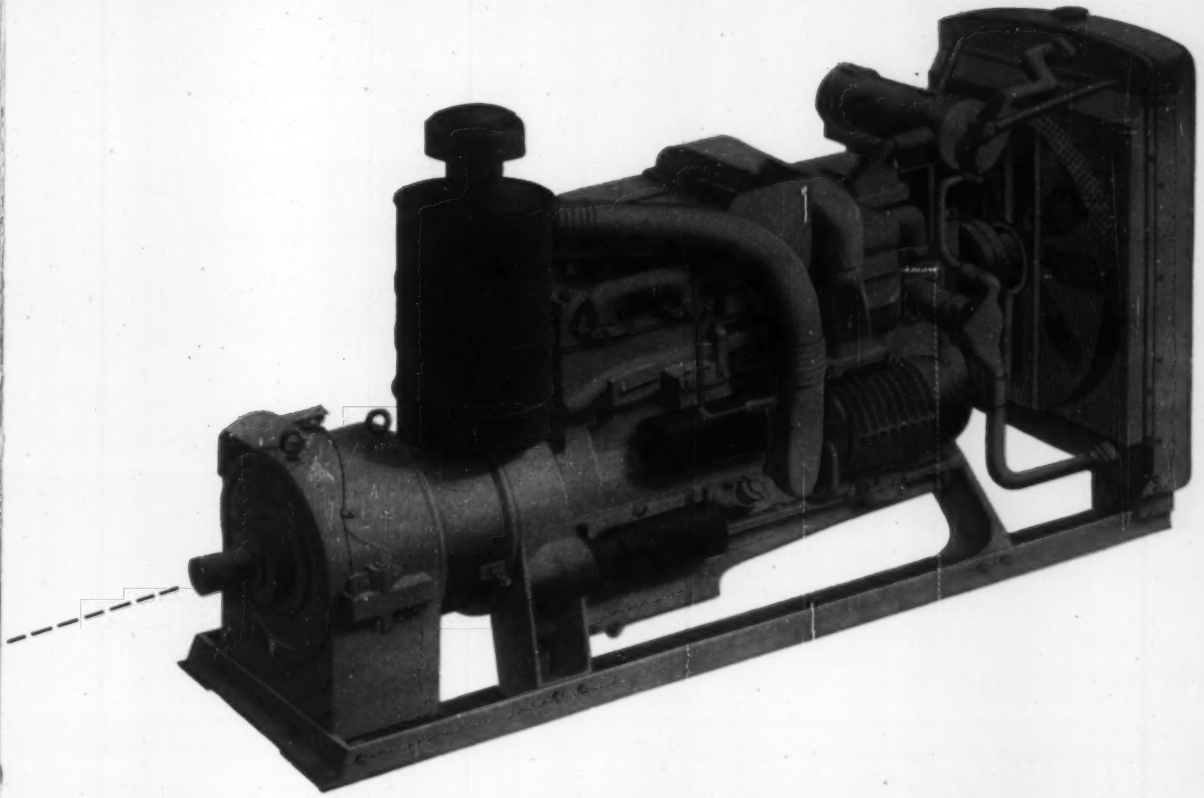
WISCONSIN CULVERT COMPANY
MADISON, WIS.

WYATT METAL & BOILER WORKS
DALLAS, TEX.
HOUSTON, TEX.

Cummins Diesel - torque converter package speeds work cycle as much as 30%

Gives full utilization of horsepower, minimizes shock





loads, adds to life of shovels, cranes, and draglines

Cummins Torque Converter Packages give smooth steady power over the entire digging or working cycle. Even where digging is the toughest and power requirements fluctuate widely, the Cummins Torque Converter maintains power without lugging, stalling or overspeeding. Crane work, too, can be speeded because loads can be handled more smoothly and accurately.

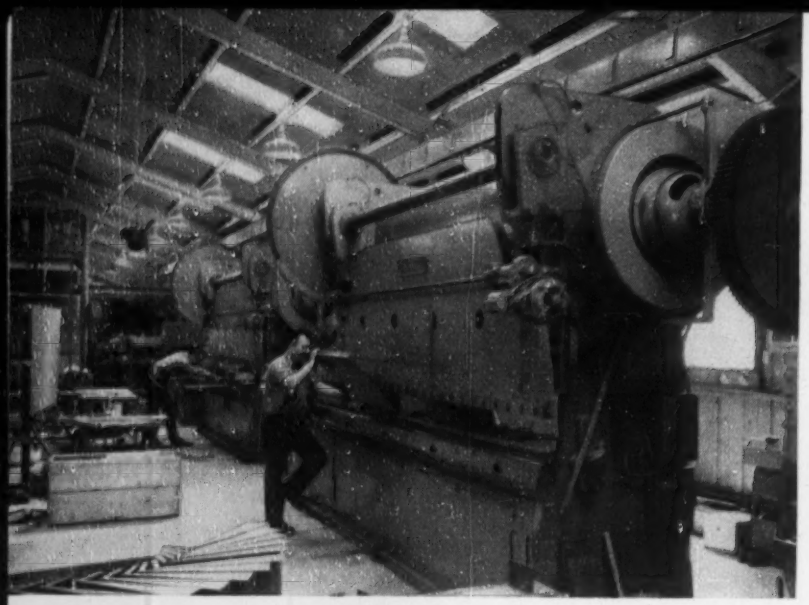
The output of the Cummins Torque Converter Package is measured by an output shaft governor which determines the exact amount of power required each instant and automatically matches engine speed to load requirements. This increases work capacity, adds to equipment life, saves fuel and engine wear.

Cummins Diesels, ranging from 60 to 600 h.p., equipped with one of many types of torque converters, can match any job you have. Available as replacement units or in many makes of new equipment.

CUMMINS

Cummins Engine Company, Inc.
Columbus, Indiana

Rugged diesel power (60-600 h.p.)



Battery of press brakes in the complete new plant of Lake Shore Electric, Inc., Bedford, Ohio. Butler steel buildings were used throughout . . . saved half the cost of new construction . . . gave Lake Shore a more efficient, better lighted, safer plant.

Buildings too *work harder, earn more—* when they're BUTLER steel buildings

Take a look at the performance of the new Butler-built plant erected for the Lake Shore Electric, Inc., Bedford, Ohio. They formerly occupied 30,000 square feet in a 4-story building—then "expanded" to a 1-story 23,300 square foot rigid-frame Butler steel building.

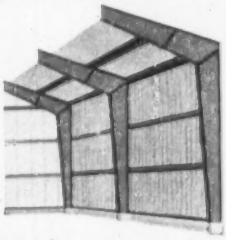
Production increased! Here is how Mr. S. W. Soos, President of Lake Shore Electric, explains it, "There is less waste motion now that everything here is on one floor. Post-free Butler construction also lets us place machines and materials for the most efficient work flow. Employees appreciate the soft, natural lighting from the Lite*Panls, and overall efficiency is improved by the convenience of our new layout. Yet square foot cost was considerably less than the cost of many common types of construction—only $6.00 per square foot *including* insulation, lighting and even overhead cranes."

Build better—for less money—with Butler steel buildings. They give you every advantage of conventional construction *plus* these profit-producing extras: (1) Your capital investment is lower, (2) Faster erection time puts you in production earlier, (3) steel or aluminum sheeting lowers maintenance costs, (4) pre-engineered Butler buildings do not become obsolete—you can profitably expand, alter or relocate them at any time to meet new demands of our fast-changing economy. Write today for full particulars about Butler buildings and the name of your nearest Butler dealer.

Here is why BUTLER is a better buy

Every Foot of Floor Space is Usable

There are no interior posts or columns to waste space and create work-slowing "bottlenecks." Rigid-frame construction also shrinks maintenance costs . . . extends building life.



Fast Erection . . . Easy Expansion

Precision-punched and dimensioned bolt holes speed erection—simplify expansion or dismantling and moving. Galvanized bolts, with Neoprene rubber washers, lock deep-corrugated sheets firmly to the sturdy frame.

Weatherproof Protection

The one-piece, die-formed roof ridge eliminates ridge roll—helps to make the building leakproof and weather-tight.

Triple-Strength Corrugated Sheets

Butler sheeting with deep-formed corrugations on 12-inch centers, is three times as strong as ordinary corrugated sheets. Overlapping corrugations bolt tightly together for maximum strength and weather protection. Your choice of steel or aluminum sheeting.

Attractive Curved Eaves

The neat, die-formed eaves—which bolt to the roof sheets—add to the appearance of Butler steel buildings...increase the strength of the eaves . . . help insure weather-tightness.

Weather-sealed Windows and Base

Where corrugated sheets meet windows or the foundation, they are tightly crimped for a snug fit that keeps out snow, moisture and rodents.

BUTLER STEEL PRODUCTS

BUTLER MANUFACTURING COMPANY

7418 East 13th Street, Kansas City 26, Missouri
918 Sixth Avenue, S. E., Minneapolis 14, Minnesota
1028 Avenue W, Ensley, Birmingham 8, Alabama
Dept. 18, Richmond, California

Manufacturers of Oil Equipment • Steel Buildings • Farm Equipment • Cleaners Equipment • Special Products

Factories located at Kansas City, Mo. • Birmingham, Ala. • Richmond, Calif. • Galesburg, Ill. • Minneapolis, Minn.

FINANCIAL AID TO HIGHER EDUCATION

What Business Can Do to Help Our Colleges and Universities

Is the financial squeeze now gripping our colleges and universities grave enough to warrant direct action by the business community? If so, what can business do about it? This editorial is addressed to these two questions.

In the previous editorial in this series of two, it was demonstrated that **our colleges and universities, and particularly the independent institutions, face financial difficulties, which, unless relieved, promise to get progressively worse and might ultimately result in a national disaster.** This state of affairs obviously gives the business community a crucial stake in helping to relieve the plight of these institutions. For our business organizations can be no stronger than the total community of which they are a part.

It does not follow automatically, however, that every business firm should give direct financial aid to education. Already the business structure is heavily burdened with activities unrelated to its main purpose. These include acting as tax collector for more than $65 billion of federal, state and local taxes in the year 1953. There is a limit to the amount of such public enterprise that can be loaded on the business system.

Business Holds Key to Answer

If, however, the survival of a key part of our educational system depends on its having financial help from the business community, that help should be provided. And this is the situation of our independent privately endowed colleges and universities.

Of course, our tax-supported institutions of higher learning must also be kept strong, financially and otherwise. But they have recourse to public support not available to the independent institutions. Largely on this account, their present financial difficulties are much less acute than those of the independent colleges and universities.

These independent institutions have seen price inflation eat away much of the value of their endowments. Moreover, there is no prospect that these endowments can be sufficiently replenished by gifts from the wealthy people who provided them in earlier years. Progressive income and estate taxes have seen to that. Thus, they are faced not only with a peculiarly acute financial problem, but also one which cannot be solved except by tapping other sources of aid.

Tax Support No Solution

It is conceivable that the independent colleges and universities might solve their financial problem by seeking support from tax revenues. If they did this, however, they would lose their distinctive character as independent institutions, and our system of higher education would lose one of its major elements of strength. That is the existence in our educational system of both independently financed and tax-supported colleges and universities. Each has its special contribution to make to a well-balanced system of higher education.

Business is directly dependent upon higher education to staff its increasingly complex and exacting operations. A key part in this process is played by the small, independent liberal arts colleges which are the hardest hit financially of all our institutions of higher learning. "These," states the Council for Financial Aid to Education, recently formed by a group of business leaders, "have contributed a high proportion of the intellectual, scientific and religious, as well as business leadership of the nation. Their programs are devoted to the teaching of values, particularly the values of freedom. They are a vital bulwark to our system of free enterprise."

Means of Providing Help

There are many means by which business firms can extend help to our colleges and universities. The most obvious, of course, is to make outright grants of money either to individual institutions or to groups of institutions for such uses as the institutions think best. Another means of help, increasingly employed by business firms, is to establish scholarships to pay the full cost of college or university courses of study. Sometimes the scholarships are open for general competition, sometimes they are limited to employees and children of employees of the firm granting them. Not infrequently those winning the scholarships spend some part of their school vacations working in the companies granting the scholarships.

A number of companies have recently provided for what have come to be called "scholarships in reverse." These companies pay a flat sum to a college or university for every one of its graduates they employ. Financing of university research programs also offers a broad avenue for financial aid to our universities by business.

Need Two-Way Communication

Some business firms have well-developed programs for financial aid to education. But they are exceptional. For most companies the problems involved are new and strange. These companies were created with the basic purpose to make money, not to give it away. Successful philanthopic operations involve a whole set of problems with which they have very little experience. Not the least of these is how to make business a dependable source of financial aid to education, since business has no assurance that the profits of one year will not be losses the next.

Considerations such as these emphasize the wisdom of a recent Industry-College Conference on aid to higher education by business, in making the first of its ten conclusions that "better communication, by direct contact, is needed for each [industry and the colleges] to understand the problems of the other." At this juncture the creation of mutual understanding is much more important than the raising of some money and letting it go at that. The problem of aid to education by business has its immediate urgency, but there is also a long-range program to be developed on which business and the colleges and universities must pull together in the years ahead to find a satisfactory solution.

As stated at the outset, failure to find a satisfactory solution could result in a national disaster. This means that, **to give proper heed to their own future prosperity and the future welfare of the nation, business firms generally must go to work on the problem of financial aid to higher education. They must go to work first, to understand the problem; second, to establish two-way communication with our colleges and universities about it; and third, to develop a program which pays proper heed to the needs and capabilities of both business and higher education.**

This message is one of a series prepared by the McGraw-Hill Department of Economics to help increase public knowledge and understanding of important nationwide developments that are of particular concern to the business and professional community served by our industrial and technical publications.

Permission is freely extended to newspapers, groups or individuals to quote or reprint all or parts of the text.

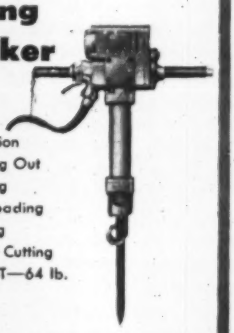
Donald C McGraw

PRESIDENT

McGRAW-HILL PUBLISHING COMPANY, INC.

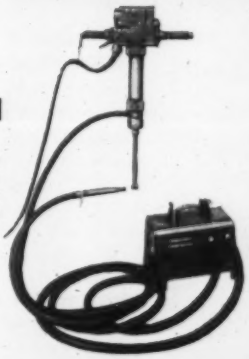
Announcing
BOSCH
High Cycle Electric Tools

Paving Breaker



FOR:
Demolition
Breaking Out
Chiseling
Clay Spading
Tamping
Asphalt Cutting
WEIGHT—64 lb.

Rock Drill



A lightweight tool that matches the performance of pneumatic Drills. Equipped with Pressure Blower.

WEIGHT:
Drill—65 lb.
Blower—20 lb.

Hammer

A Lightweight Builders Hammer

FOR:
Chiseling
Chipping
Drilling
Cutting
Same Tool
Drills & Strikes

WEIGHT—14 lb.

HOMELITE
Dual Purpose Generator

The power supply for Bosch tools — 2,500 watts — operates both High Cycle tools and Standard 110 volt electric tools and floodlights.

WEIGHT 138 lbs.

These ruggedly built tools are real cost cutters on any job. They combine low initial cost with low operating cost for unexcelled economy.

Lightweight — simple in design, yet they give performance equal to bulky, expensive, compressed air equipment.

HIGH CYCLE electric motors, powered by Homelite's dual purpose generator, will give you greater flexibility and thousands of hours of heavy-duty service. Ask for an on-the-job demonstration or for more information. Write Homelite Corporation, Port Chester, New York.

Manufacturers of Homelite
Carryable Pumps • Generators
Blowers • Chain Saws

PERFORMANCE · DEPENDABILITY · SERVICE

HOMELITE
CORPORATION

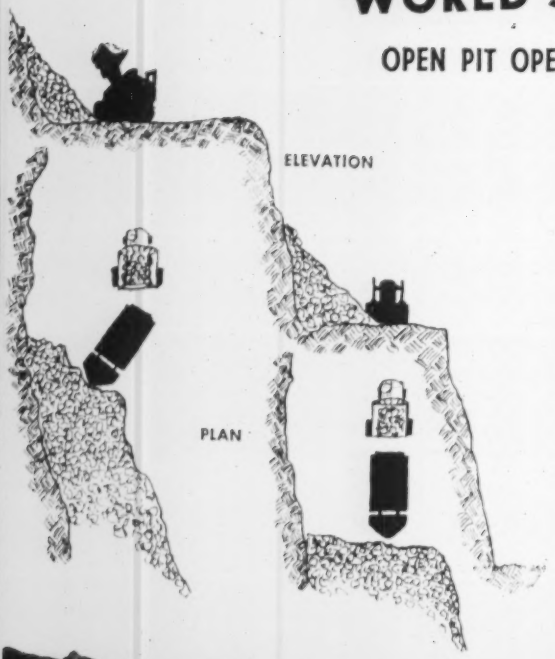
1106 RIVERDALE AVENUE • PORT CHESTER, N. Y.

Canadian Distributors: Terry Machinery Co., Ltd., Toronto, Montreal, Vancouver, Quebec.

EIMCO

WORLD'S FINEST TRACTOR-EXCAVATOR

OPEN PIT OPERATIONS INCREASE PRODUCTION WITH SMALL INVESTMENT



Eimco 105 tractors with excavating RockerShovel attachment are being used in open pit mining with extraordinary results:

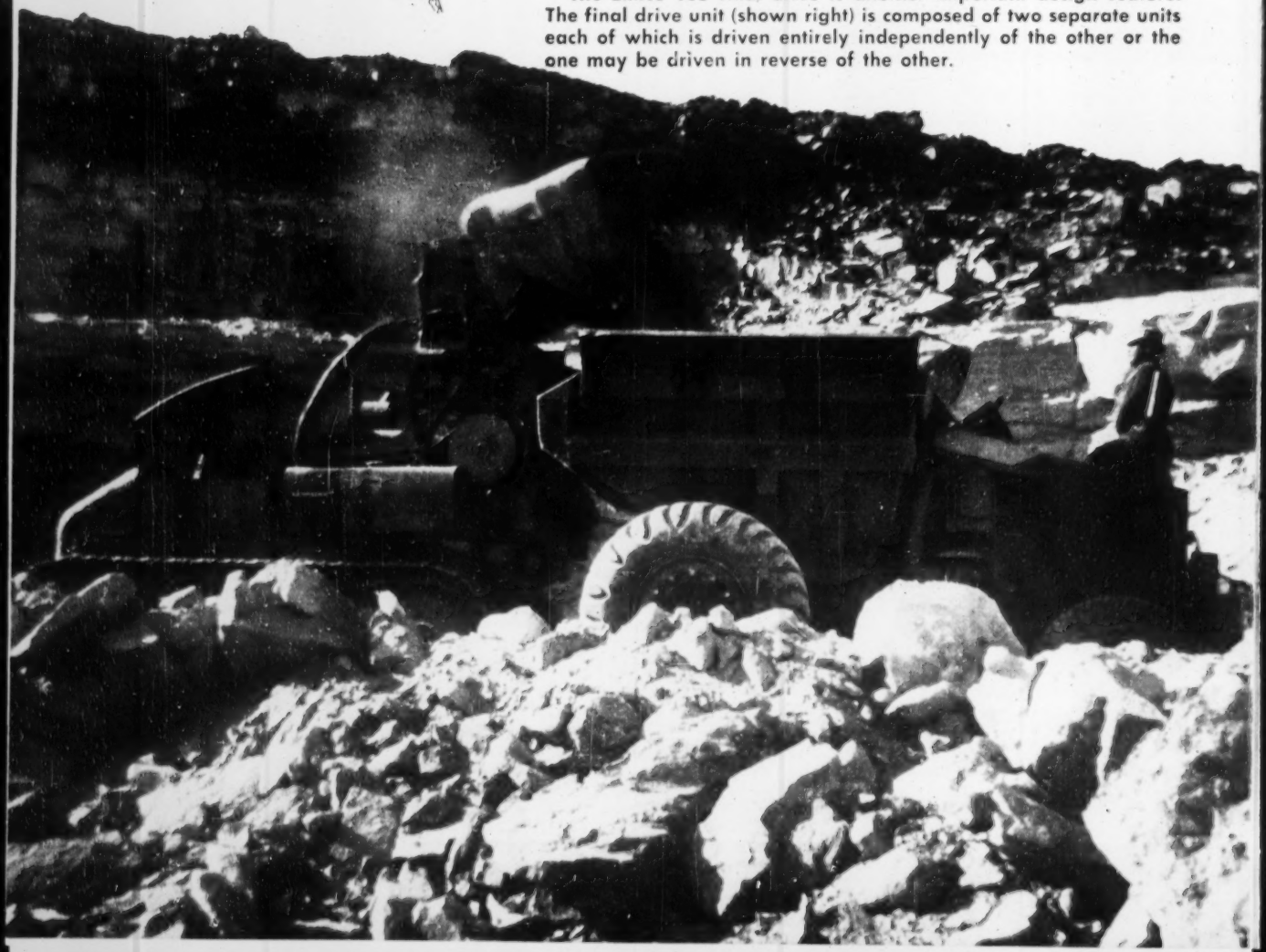
Loading time 6 yd. truck	45-50 secs.
Average payload per truck	10 tons
Based on 50 min. hr. and half minute switching time for trucks average hourly production	400 tons

Exceptional loading in many operations has shown even greater tonnage figures where material handled was from stock pile and haulage traffic was not confined to narrow roadways such as encountered in benches of open pit systems.

Eimco 105's are in use by contractors in tunnels and on new construction, rock quarries, underground mining, steel mills and on many other jobs. Where speed and dependability are essential the 105 has proved to be the most rugged piece of equipment ever used.

The exceptional features of the 105 make it the finest piece of equipment of its type ever produced. The Unidrive transmission which contains all clutches and gearing for instant reversal, independent track control and gear changing without stopping are indicative of the new approach to heavy prime moving equipment.

The Eimco 105 final drive is another important design feature. The final drive unit (shown right) is composed of two separate units each of which is driven entirely independently of the other or the one may be driven in reverse of the other.



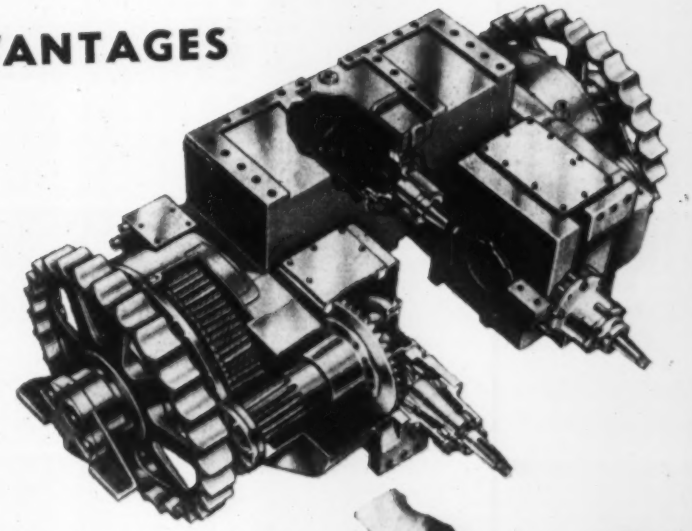
WITH COST SAVING ADVANTAGES

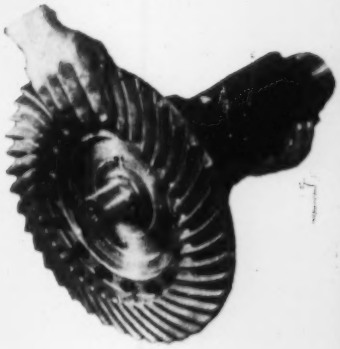
These final drives are each powered through matched pinion, ring gear sets through heavy, short shafts, husky pinions and gears. Even the short shafts are heavier in construction and larger in diameter than similar shafts used in any large tractor on the makert today. Shafts roll in Timken bearings that are separately caged for easy access, perfect alignment and long life. All clutches and brakes in final drive are eliminated. Gear cases are heavy alloy cast steel. Sprockets, gears and other parts are specially heat-treated for long service life.

Additional exclusive featuers include full oscillating tracks even with the excavator attachment. Easy simple controls, torque converter drive, full visibility with operator up front, all steel construction, clutches that never need adjustment.

These are the unique features that make the 105 the most maneuverable heavy tractor on the market.

We invite you to see, operate and compare the 105 with any other crawler prime mover. Write for information to The Eimco Corporation, P. O. Box 300, Salt Lake City, Utah, or to any Eimco branch.





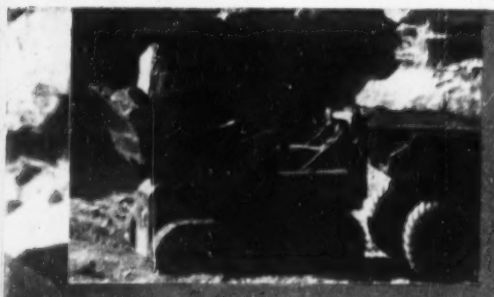
The bevel gear on the final drive pinion shaft. This is an example of the husky construction of all 105 parts.

Loading trucks on the pit bench. 105's maneuverability permits trucks to stay in close.

Huge boulders are pushed over side by 105 with excavator attachment.

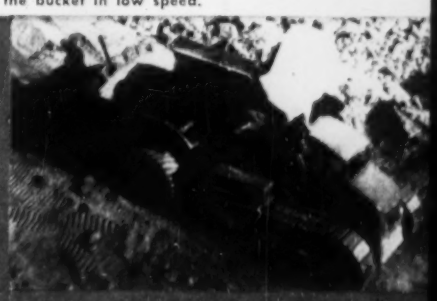
The 105 picks up and loads larger pieces than can be handled by 1½-2 yard conventional shovels.

105 picks up load and waits for truck to position itself then —



A pull on the lever and over it goes. Heavy duty trucks can be loaded fast, with the bucket in high.

Less rugged equipment can be loaded easily with the bucket in low speed.

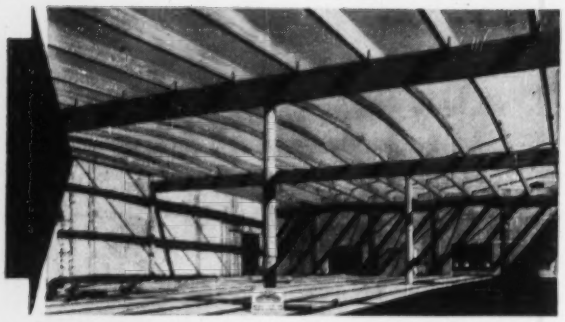


THE EIMCO CORPORATION

Export Offices: Eimco Bldg., 52 South St., New York City • Salt Lake City, Utah—U.S.A.

Branches • New York, 51-52 South Street • Chicago, 301 So. Hicks Road, Palatine, Ill. • El Paso, Texas • San Francisco, 637 Cedar St., Berkeley, Cal. • Birmingham, Ala., 3140 Fayette Ave. • Duluth, Minn. • Kellogg, Ida.

B-40



One of seven 180′ x 100′ bays of Mt. Rainier Ordnance Depot near Tacoma, Wash. Carrying beams are 11″ x 35¼″, spaced at 60 feet. Cantilevered purlins are 7″ x 24⅛″, tapered to 7″ x 13″ in the center section and spaced at 8 feet. Roof deck is heavy tongue-and-groove sheathing with built-up roof surface. Design by Army Corps of Engineers; John H. Sellen Construction Co., Seattle, general contractor.

Bargain in Efficient Floor Space

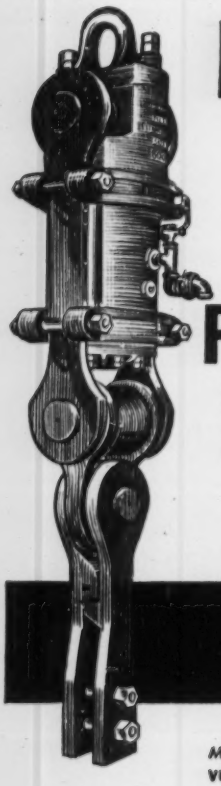
This warehouse, which has only four posts for each 18,000 square feet of floor area, is an object lesson in permanent construction, quickly erected and at low cost. Beam and purlin roof framing is dimensionally stable, requires no maintenance, and permits minimum cubage. This reduces construction costs and heating expense.

Structural problems of many kinds are met economically and permanently with timber arches, trusses and rigid frames. For detailed information on these structural units see your nearest Timber Structures office, or write us for a free copy of booklet, "Modern Construction".

TIMBER STRUCTURES, INC.

P. O. BOX 3782-C, PORTLAND 8, OREGON

Offices in Ramsey, N. J.; Chicago; Detroit; Lenexa, Kansas; St. Louis; Minneapolis; Columbus; Omaha; Des Moines; Dallas; New Orleans; Birmingham; Charlotte; Memphis; West Hartford; Seattle; Spokane; Eugene; Richmond, Calif.



POWERFUL PULL VULCAN PILE EXTRACTORS

Specialized power for pulling piles under the toughest conditions. Only one moving part, requires no adjustments and can't get out of order.

WRITE TODAY FOR COMPLETE DETAILS AND NAME OF NEAREST DEALER

VULCAN IRON WORKS

Manufacturers of Pile Driving Hammers and Pile Extractors Since 1852

VULCAN IRON WORKS • 329 NORTH BELL AVENUE • CHICAGO 12, ILL.

OBITUARIES

Milo L. Cleveland, 75, a civil engineer, whose firm built large sections of the New York State Barge Canal and the North Channel of the St. Lawrence River and its locks, died June 1 in Rochester, N. Y. A 1905 Cornell University graduate, he joined his father's firm, Cleveland & Sons, in Brockport, N. Y. He later headed the firm and during the last war did ordnance construction work in Pennsylvania.

Floyd J. Dutcher, 61, retired civil engineer, formerly with the New York Central Railroad, died May 22 at Watertown, N. Y. He was with the railroad more than 33 years. He was a graduate of Clarkson College of Technology, and was in charge of the engineering corps of the railroad's maintenance of way department.

Ernest F. Learned, 79, of Weymouth Heights, Mass., formerly with the Stone & Webster organization as a railway construction and hydroelectric engineer, and for many years representing material handling manufacturers in the New England area, died May 30. He was a graduate of the Massachusetts Institute of Technology, and devoted considerable time in his earlier career to transmission right-of-way work in Minnesota and Georgia.

Andrew J. Crowe Jr., 65, a senior civil engineer in the New York State Department of Public Works, died May 22 in Albany, N. Y.

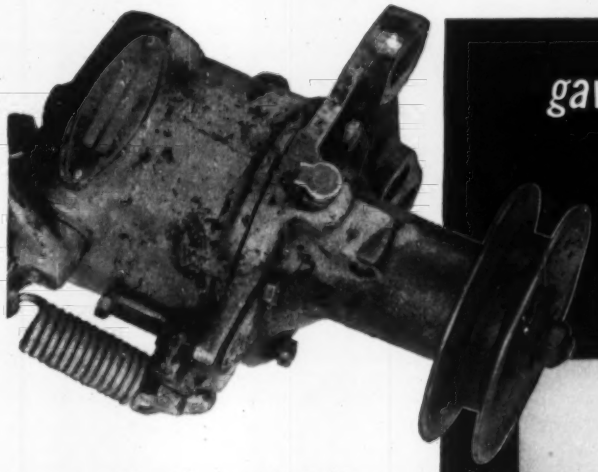
Guy H. Bailey, 67, an outstanding railroad construction engineer, died in Boise, Idaho, recently. His career ranged from assisting the construction of the Alaskan Railroad from Anchorage to Seward in 1916, to World War II rehabilitation of the Lucin cut-off across Great Salt Lake in Utah without interrupting the 24-hour flow of wartime traffic. He had been in semi-retirement for the last five years.

John F. Foreman, 67, former member of the firm of Joseph Silliman & Son, Altoona, Pa., civil and mining engineers, died May 30 in Cresson, Pa. He was superintendent of the Argyle Coal Company at the time of his death.

Frank Lee Nicholson, 85, who for 29 years prior to his retirement in 1947, was chief engineer of the Norfolk Southern Railway, died at Norfolk, Va., recently. After leaving the rail-

(*Continued on page 87*)

this PIERCE GOVERNOR



gave 22,000 hours of service without repair!

KENNETH FORKER
CRANE SERVICE - MARL - BULLDOZING
ALBION, INDIANA
PHONE 2304

November 21, 1952

The Pierce Governor Company, Inc.
Anderson, Indiana

Attention: Mr. Thos. L. Marks

Dear Sir:

I have a Pierce governor on an industrial power unit in an Osgood crane. I bought the crane in January 1946, and it has been in continual use since that time. It has an hour meter which registers 22,000 hours. Figuring 10 miles per hour this governor would have 880,000 miles, giving complete service without repairs.

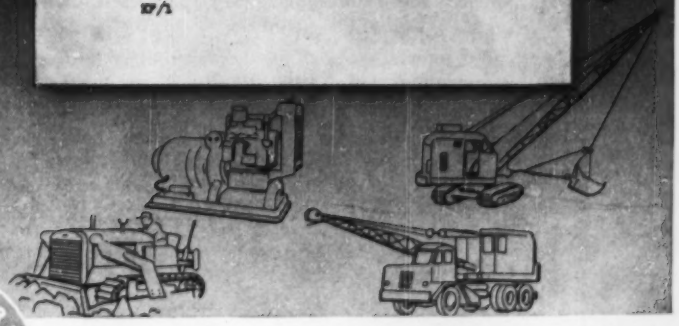
I believe this is very good service and certainly speaks a good word for the Pierce governors.

Just wanted you to know how satisfied I am with your governor.

Very truly yours,

Kenneth Forker

KF/A



it's dependability like this that makes **Pierce Governors PREFERRED**

Mr. Forker's Pierce Governor worked the equivalent of 12-hour days for six straight years without the first sign of trouble or wear.

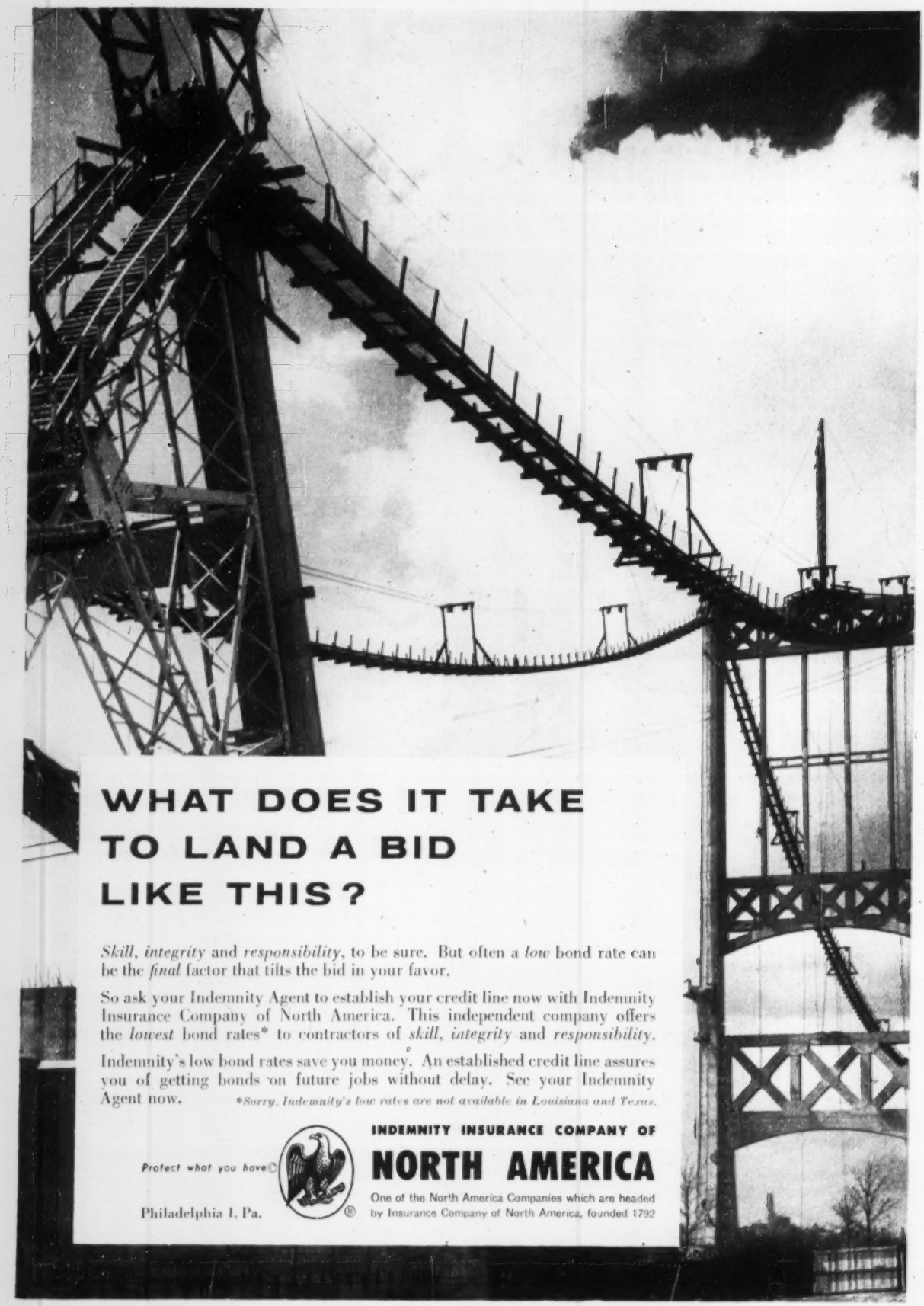
When you buy Pierce-governed power equipment you are assured of unsurpassed governor performance and trouble-free service . . . usually for the life of your engine. That's why Pierce is preferred.

There's a Pierce Centrifugal Governor for gas, gasoline and diesel engines in every industrial use. Write for specific information.

The PIERCE GOVERNOR CO., Inc.
1622 OHIO AVENUE
ANDERSON, INDIANA

PIERCE — THE MARK OF QUALITY

If your present governor is giving you trouble, tell us about it. Chances are we can supply you with a replacement that will solve your problem fully.



WHAT DOES IT TAKE TO LAND A BID LIKE THIS?

Skill, integrity and *responsibility*, to be sure. But often a *low* bond rate can be the *final* factor that tilts the bid in your favor.

So ask your Indemnity Agent to establish your credit line now with Indemnity Insurance Company of North America. This independent company offers the *lowest* bond rates* to contractors of *skill, integrity* and *responsibility*.

Indemnity's low bond rates save you money. An established credit line assures you of getting bonds on future jobs without delay. See your Indemnity Agent now.

**Sorry, Indemnity's low rates are not available in Louisiana and Texas.*

Protect what you have©

Philadelphia 1, Pa.

INDEMNITY INSURANCE COMPANY OF

NORTH AMERICA

One of the North America Companies which are headed by Insurance Company of North America, founded 1792

way Mr. Nicholson continued his membership on the Norfolk Planning Commission. He served 17 years and was chairman for six years. Prior to joining the Norfolk Southern, Mr. Nicholson was with the Atlantic and Danville Railway, the Wilmington, New Bern and Norfolk Railroad, the Atlantic Coast Line Railroad and the Raleigh, Charlotte and Southern Railroad. He had been on the board of direction of the American Society of Civil Engineers (1929-31).

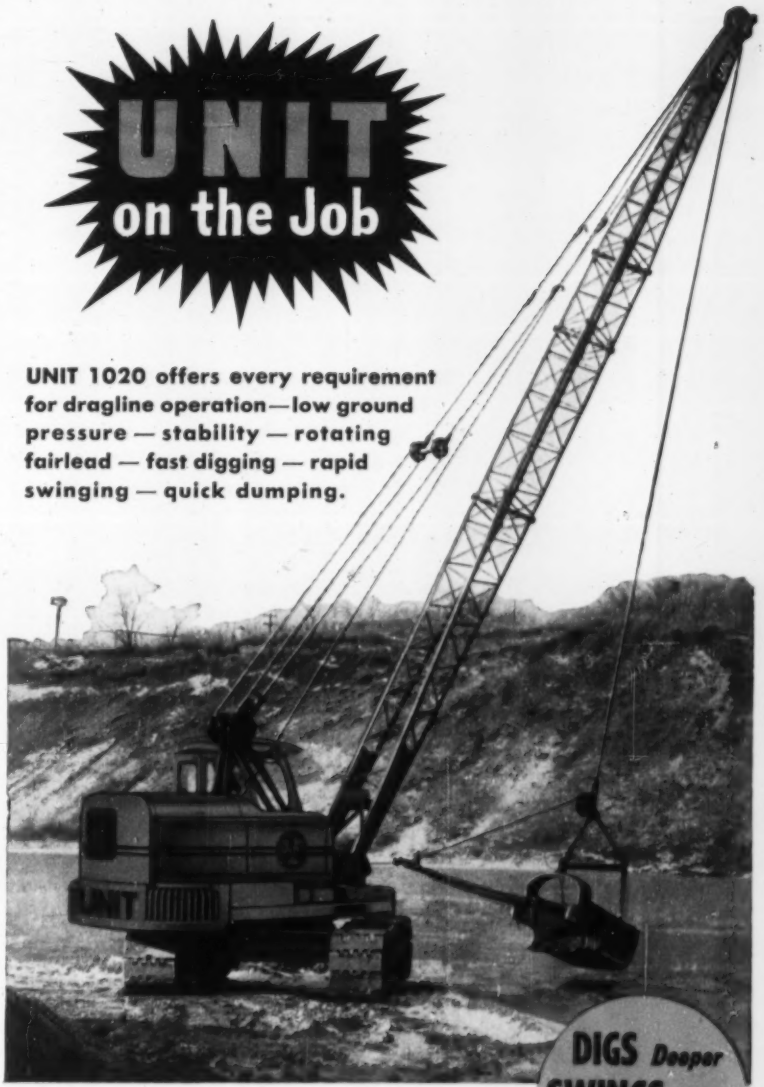
Wilfred L. Rowe, 71, an engineer with the Bureau of Reclamation for 43 years before his recent retirement, died at Denver, Colo., May 17. He was a C.E. graduate of the University of Wisconsin.

J. M. R. Fairbairn, 80, chief engineer of the Canadian Pacific Railway from 1918 to 1938, died in Montreal May 27. His association with the engineering work of the C.P.R. from 1901 until 1938 provided a link with the greatest days of railroad construction in Canada. He was graduated from the University of Toronto in civil engineering. He became a principal assistant to the C.P.R. district engineer in Montreal in 1901 and served with the railway until his retirement on Dec. 13, 1938. He came out of retirement to aid Canada's war effort, serving in the Department of National Defense in 1941. He received many honors, having been the president of both the Engineering Institute of Canada (1921) and the American Railway Engineering Association (1925). From the Engineering Institute, he received its highest award, the Sir John Kennedy medal, in 1946.

Sam S. Headman, 66, head of the Phoenix, Ariz., firm of Headman, Ferguson, and Corollo, died May 22 at Phoenix. His firm was prominent in construction and expansion of the domestic water and sanitary sewer systems in Phoenix and in many western municipal developments. He was a graduate of the University of California. During World War I he was with the signal battalion and later worked as a draftsman for the American Oil Engineering Corp. in Oklahoma. He went to Arizona to become assistant construction supervisor for diesel unit installation for the Tucson Electric Light, Gas, and Power Co. He was general manager of the firm from 1924 to 1927 when he became construction engineer for the Federal Light and Traction Co. He helped design and construct power plants in New Mexico, Arkansas, and Arizona.

UNIT on the Job

UNIT 1020 offers every requirement for dragline operation—low ground pressure — stability — rotating fairlead — fast digging — rapid swinging — quick dumping.



DIGS Deeper
SWINGS Easier
LOADS Faster

Perfectly balanced for long boom operation, the UNIT 1020 is ideal for general excavation work, sand and gravel pits, irrigation, drainage and stripping operations. Available with UNIT TORQUE DRIVE, this machine gives you smooth performance, eliminates "shock loads", cuts fuel expense. Write for literature.

UNIT CRANE & SHOVEL CORPORATION
6315 WEST BURNHAM STREET • MILWAUKEE 14, WISCONSIN, U. S. A.

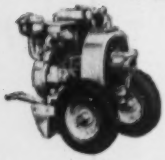
UNIT

½ or ¾ YARD EXCAVATORS...CRANES UP TO 20 TONS CAPACITY
CRAWLER OR MOBILE MODELS . . . GASOLINE OR DIESEL

All Models Convertible to ALL Attachments!

Dewatering 58 ft. deep bridge pier coffer on Cumberland River near Gallatin, Tenn. J. M. Hickman, Contractor.

4000 gpm...at only 1500 rpm



Jaeger builds longer life into small pumps, too.

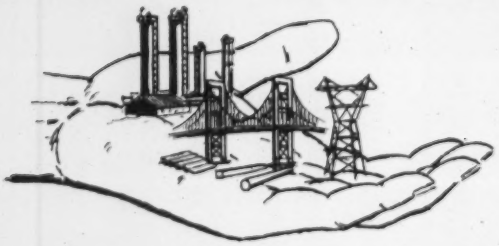
When you can move 4,000 gallons of water a minute, with diesel fuel economy *and at recommended diesel engine speed*, that's low cost pumping. Ordinary pumps can't do it but a Jaeger 10PD can — because Jaeger Sure Prime pumps are built bigger, to prime and pump at slower speeds than others. It pays off in long engine and pump life — every time.

1½" to 10" — gas, diesel, electric. Catalog P-10.

THE JAEGER MACHINE COMPANY 200 Dublin Avenue Columbus 16, Ohio

LOADERS • COMPRESSORS • MIXERS • PAVING MACHINES

What Do You Need of STEEL!



FLINT can supply you with anything you need in STEEL from steel mesh to the largest processing towers. No order is too large or too small, and deliveries are fast. Whatever you need: GALVANIZED and STRUCTURAL Steel; PLATE Steel; or WAREHOUSE Steel . . . call FLINT.

A Complete Service: STEEL • FABRICATION • ERECTION • DETAILING

Serving Southwest Industry Since 1915

FLINT STEEL FLINT STEEL CORPORATION

P. O. Box 1289 • TULSA, OKLA.

LEGAL

Right to make changes

A contract provided for payment of a stipulated sum for the performance of the work. It gave the party for whom the work was being done the right to make changes in the work and set forth certain unit prices that would be applied in the event that additions or omissions were made in the work.

During the progress of the work various change orders were issued and the contract price was increased or diminished in accordance with the stipulated unit prices. One change order eliminated a part of the work. The contractor claimed that the above provision of the contract did not apply to parts of the work that were completely eliminated and brought an action to recover amount allegedly due, including payment for the part of the work that had been eliminated.

The action was dismissed, the court in its opinion, stating: "As this court construes the contract, the defendant must pay the plaintiff the contract price, less the amount for deductions. Otherwise where is the value of the contract? No one claims that the contract has been breached or rescinded. The type here executed is a familiar one in construction work. It provides for a basic price, with adjustments for additions and deductions. The basic price type assures the contractor payment at least for some of his overhead, for the cost of moving equipment to the job, for estimating, bonds and the like. The assurance that it would not have to bear the risk of loss of its overhead and expense of moving equipment affects the price one will bid for a job."[1]

(1) New England Foundation Co. v. F. H. McGraw & Co., 113 F. Supp. 246, U. S. District Court of Rhode Island, May 6, 1953.

Substantial performance

A contractor brought an action to recover a balance due under a contract. The owner interposed the defense that the contractor had not completely performed the contract and therefore was not entitled to any recovery. The court found as a fact that the contractor had substantially performed the contract and was entitled to recover the balance due under the contract less the cost of remedying the alleged defects in the work.

This judgment was affirmed by the appellate court,[1] that court in its opinion, stating: "Appellant [owner] insists that inasmuch as there was a fail-

(*Continued on page 92*)

Cut construction costs TWO WAYS

with Amcreco Creosoted products

1. LOW FIRST COST!

2. LOW MAINTENANCE COST!

Amcreco Lowry Process Creosoted Products

TIMBERS • PILES
FRAMED BRIDGE TIMBERS
PLANKING • POLES
CONDUIT • BRIDGE TIES
CROSS ARMS
ADZED AND BORED CROSS TIES

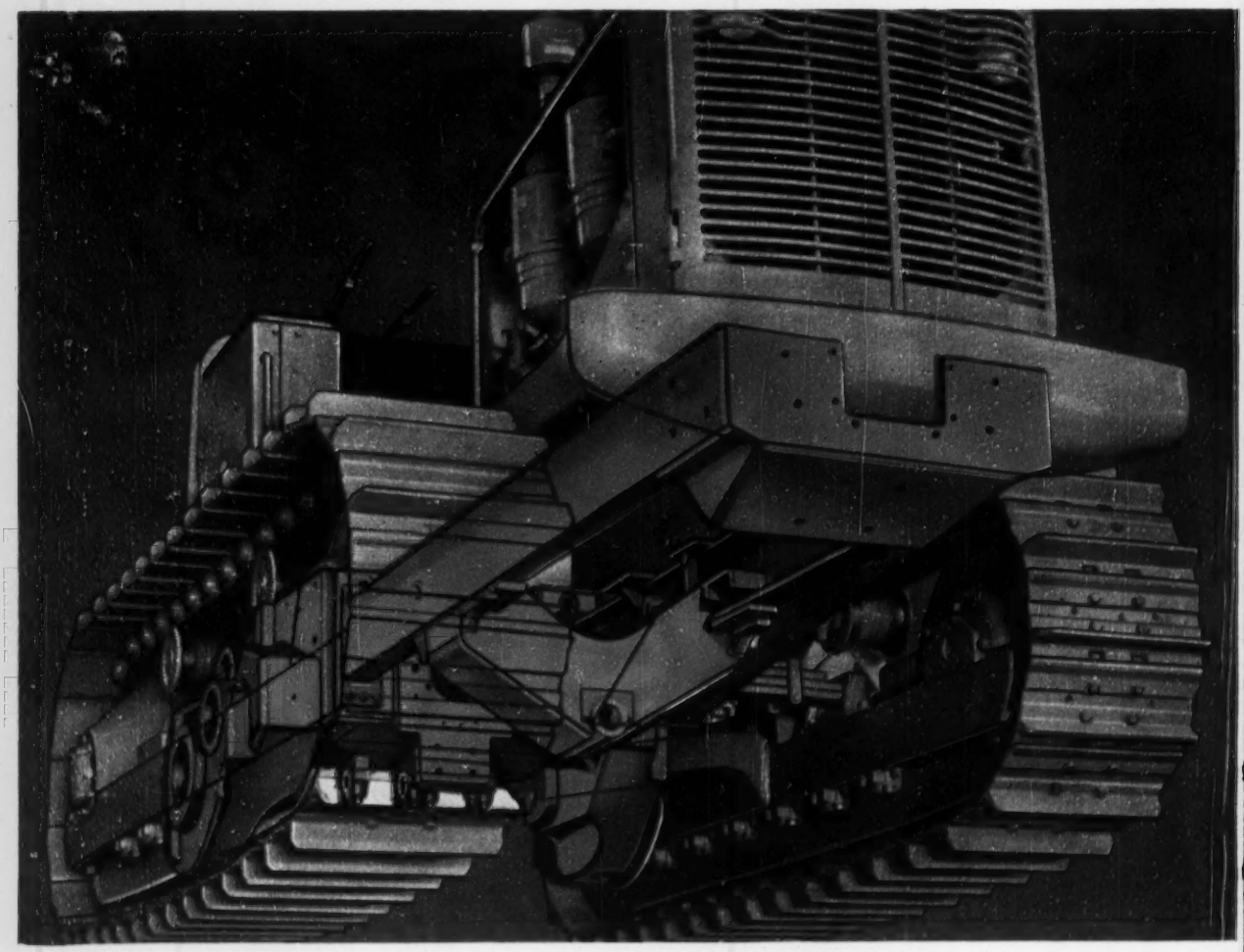
• Experience on all types of jobs all over the country has proved the long-run economy of Amcreco Creosoted Products. Pressure creosoted, they provide long life and dependable service even under the severest conditions. Plan to get the complete facts, today

AMERICAN CREOSOTING COMPANY
INCORPORATED

COLONIAL CREOSOTING COMPANY INCORPORATED
AMCRECO
GEORGIA CREOSOTING COMPANY INCORPORATED

ADDRESS INQUIRIES TO CHICAGO, ILL., OR LOUISVILLE, KY.

Pressure treated for strength that lasts!



HOW THE MAIN FRAME CONTRIBUTES TO TOP TRACTOR PERFORMANCE

All-Steel Box A-Frame is a Key to Outstanding, Low-Cost Record of Allis-Chalmers Tractors

Contractors all over the country are putting new emphasis on shrewd equipment buying. And rightly so. To win bids, stay on schedule and make a profit in the face of today's keen competition, they have to be *sure* of getting top value in design, performance and service features.

More and more of these contractors are now using Allis-Chalmers tractors. One of the big reasons is hidden in the heart of the tractor. It's the exclusive design which characterizes the main frames of all four Allis-Chalmers tractors. These frames are one-piece, all-steel, welded structural members (like the girders in a bridge or the columns in a building). They help provide greater strength and flexibility to withstand shock loads, better equipment mounting, improved weight distribution and outstanding service simplicity.

We invite you to see these advantages . . . first at your nearby Allis-Chalmers dealer, and then in a demonstration. Whichever size you may be interested in, you'll see a tractor that is not just modified . . . but designed new-from-the-ground-up to meet the needs of today's jobs.

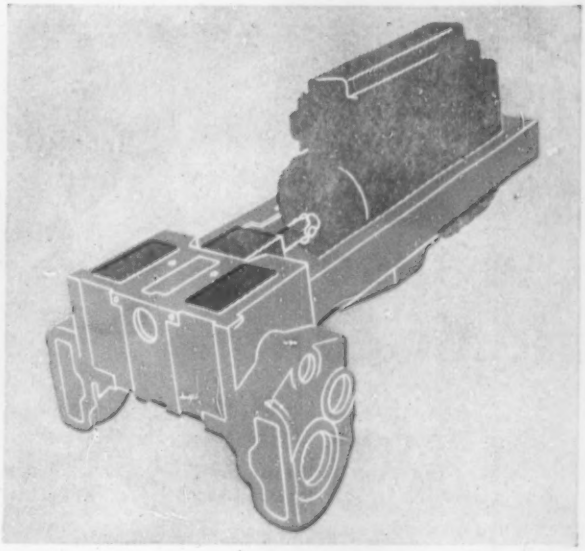
ALLIS-CHALMERS

TRACTOR DIVISION · MILWAUKEE 1, U. S. A.

"Rolls with the Punch" — The resiliency of the high-tensile steel main frame enables it to flex slightly under extreme shock loads . . . without transmitting the strain to engine, clutch or transmission . . . thus offering extra protection to the complete machine.

Weight Distribution Designed for Today's Jobs— Box A-Frame lets Allis-Chalmers use a modern engine . . . locate main parts for best over-all balance . . . put more weight lower in tractor where it does the most good . . . make the tractor "built to take it."

Better Equipment Mounting — Designed to best serve changing tractor application (today over 70 percent of all tractor equipment is mounted), this compact main frame allows bulldozers to be mounted in close . . . provides ample clearance for equipment like front-end shovels . . . permits wide track shoes . . . improves performance of the entire unit.



Unit Construction for Service Simplicity — Since the main frame carries the *structural* load, power drive components are designed to do only their specific jobs. They can be readily removed, repaired or replaced without disturbing adjacent parts . . . saving service time . . . actually cutting down time because assemblies can easily be serviced under shop conditions if desired.

HD-20	HD-15	HD-9	HD-5
Weight 41,000 lb Hydraulic Torque Converter Drive 175 net engine hp	Weight 28,000 lb Choice of standard transmission or hydraulic torque converter drive	Weight 18,800 lb 72 drawbar hp	Weight 11,250 lb 40 drawbar hp

but also significant

Loads like this have to be handled infrequently but when they are encountered they can't be permitted to stop operations.

If it's an Owen Bucket you can handle such unusual, especially difficult loads without fear of damage to the bucket.

Long experience has taught Owen Engineers where to build in the extra strength in additional material or *special* steel to withstand the abuse to which all buckets are subjected occasionally. That's why they render service for uncommonly long periods with remarkably low repair and maintenance expense.

AN ARMFUL AT EVERY GRAB

THE OWEN BUCKET CO.

6010 Breakwater Ave., Cleveland 2, Ohio

BRANCHES: NEW YORK, PHILADELPHIA, CHICAGO, BERKELEY, CALIFORNIA, FT. LAUDERDALE, FLORIDA

ure to perform the contract completely there can be no recovery. The contention overlooks the substantial performance doctrine, which is universally applied by the courts of this and other states. Under the rule, a builder, upon substantial performance, is entitled to recovery of the contract price notwithstanding the work may have been defective or incomplete. The remedy of the owner is the recovery of damages on account of incomplete or defective work. Cassinelli v. Stacy, 238 Ky. 827, 38 S.W. 2d 980."

(1) Meador v. Robinson, 263 S.W. 2d 118, Court of Appeals of Kentucky, Dec. 18, 1953.

Additional pay for work covered by the contract

A promise to pay additional or different compensation to the other party to the contract for the performance of what the other party is already obligated to do, is without consideration and is unenforceable. However, the parties can overcome this legal obstacle, by entering into a new contract as a substitute to the original one.

"The law is well settled that where a contract has not been fully performed by plaintiff at the time of the new agreement and the substitution of a new contract for the old contract, while still unperformed, is sufficient consideration for the new contract."[1] The court cites numerous cases to sustain this proposition of law.

(1) Denton v. Mitchell, 262 S.W. 2d 639, Court of Appeals of Missouri, Nov. 25, 1953.

Failure to complete at specified time

Where builder agreed to deliver building complete and ready for occupancy at a specified time, the failure to do so constitutes a breach of the contract and entitles buyer to recover damages sustained by failure of performance.[1]

The court in its opinion stated that the term "ready for occupancy" does not have any clear or definite meaning, and under such circumstances oral testimony was admissible to show that the parties at the time they entered into the contract intended that the seller would deliver the building to the buyer completed in a good and workmanlike manner at the specified time.

(1) Maier v. Arsenault, 100 A. 2d 403, Supreme Court of Errors of Connecticut, Oct. 27, 1953.

(These summaries of court decisions are prepared by J. Vernon Werbin, New York attorney and civil engineer.)

TO LICK the really rough ones *on schedule*, mount U. S. Royal Nylon Con-Trak-Tors on your equipment.

ALL-NYLON STRENGTH

The Con-Trak-Tor's Nylon cord carcass *won't quit* under vicious shocks and jolts. You're sure to get all the long service life built into this great tire.

TRIPLE IMPACT PROTECTION

1. *Extra rubber* between cord plies. 2. *Double shock-pads* beneath the tread. 3. *Built extra-tough at the crown* to withstand snags and rocks.

FULL LUG TRACTION

The Con-Trak-Tor's *full-width* lug design pulls you through where others bog down, won't strand you in heavy going, gives *extra* protection from side-slip.

Talk the Con-Trak-Tor over with your U. S. Royal Dealer. He can equip you with the size you need for the job you want to get done!

Tough Jobs Get Done ...on NYLON!

U.S. ROYAL

CON-TRAK-TOR
FULL LUG

US RUBBER UNITED STATES RUBBER COMPANY

CONSTRUCTION REPORTS

Bids Asked—Low Bidders—Contracts Awarded—First Section—

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 36, N. Y., ELSIE EAVES, Manager
J. A. MAHONEY, M. O. WETZEL, L. M. WINISKI, M. E. SCIORRA, F. S. DEMBEK, Reports.
J. H. WEBBER, M. R. ROESSLER, E. R. HUBER, Statistics.

NEW ENGLAND

BIDS ASKED—HEAVY CONSTRUCTION

▲† **Mass., Falmouth**—READINESS HANGAR—BA 6/25—U. S. Eng., 857 Commonwealth Ave., Boston, readiness hangar, connecting facilities, aircraft maintenance hangar, Otis Air Force Base, Eng. 19-016-54-115, $750,000 and $1,000,000. Plans deposit $25, refundable. Condon-Gurney & Towle, Inc., 53 State St., Boston, engr. CD 5/26.

† **Mass., Bedford**—WAREHOUSE—BA 6/28—U. S. Eng., 857 Commonwealth Ave., Boston, base warehouse, Hanscom Air Force Base, ENG-19-016-54-8, $500,000 to $1,000,000. Plans deposit $10 refundable. CD 5/19.

† **N. H., Portsmouth**—TRAINING BLDG.—BA On Or About 7/9—U. S. Eng., 857 Commonwealth Ave., Boston, Mass., operational training bldg., Portsmouth Air Force Base, ENG-19-016-54-122 (Group 14). $250,000. Koehler & Isaak, 922 Elm St., Manchester, archts. CD 6/4.

† **N. H., Portsmouth**—CLINIC, DISPENSARY—BA On Or About 7/28—U. S. Eng., 857 Commonwealth Ave., Boston, Mass., dental clinic and dispensary, Portsmouth Air Force Base, ENG-19-016-54-129 (Group 15). $500,000. Tracy & Hildreth, 4 Davis Ct., Nashua, archts. CD 6/4.

BIDS ASKED—BUILDINGS

▲ **Mass., Waltham**—INSURANCE—BA 6/22—Boston Manufatturers Mutual Fire Insurance Co. and Mutual Boiler & Machinery Co., 60 Batterymarch St., Boston, (selected list bidders) insurance bldg., Rte 128 near Cambridge Reservoir. $1,500,000. Anderson & Beckwith, 11 Beacon St., Boston, archts. CD 4/1.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

Verrier Constr. Co., 65 Commercial St., Portland, Me. CA $861,510. est. $1,000,000. Contr. 8-1 FERRY TERMINAL, BAR HARBOR, ME. State. Dir. Marine Port Auth., Main State Pier, Portland, Me. CD 5/25, under LB.

MASSACHUSETTS—Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston,

Eastern Roads Co., 101 Terrace St., Roxbury, Mass. LB $566,441, est. $540,000. reconstr. hy. Rte. 6, Mattapoisett. Bids June 1. CD 5/19.

Petricca Constr. Co., 534 West St., Pittsfield, Mass. CA $523,130. est. $450,000. hy. and bridge work, New Ashford. CD 5/24 under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Joseph Rugo, Inc.**, 581 Boylston St., Boston, Mass. CA $2,700,000. state OFFICE, Grove, Capitol and Jackson Sts., AUGUSTA, ME. State P. Bldgs., State House, Augusta, Me. CD 6/2, under LB.

▲ **J. G. Roy & Sons Co.**, 21 Silver St., Springfield, Mass. CA $1,437,213. HIGH SCHOOL, equipment Delogia Tract, AGAWAM, MASS. Town, 100 Main St., Agawam, Mass. CD 6/2, under LB.

Park Constr. Co., Inc., 40 Court St., Boston, Mass. LB $704,000. est. $750,000. East Junior High SCHOOL, 341 Mt. Auburn St., WATERTOWN, MASS. Town, 30 Common St., Watertown, Mass. Bids June 1. CD 5/18.

▲ **Molony & Rubein Constr. Co.**, 66 Wickenden St., Providence, R. I., CA $1,013,564, est. $1,000,000. Proj. HOS 3-3/1 GERIATRICS BLDG., State Hospital, HOWARD, R. I. State and Providence Plantations, F. A. Adams, purch. agt., State House, Providence, R. I. Bids May 5. CD 5/11, under LB.

▲ **Turner Constr. Co.**, 420 Lexington Ave., New York 17, N. Y. CA, $10,000,000, HOME OFFICE, 268 acre tract BLOOMFIELD, CONN. Connecticut General Life Insurance Co., 55 Elm St., Hartford, Conn. Skidmore, Owings & Merrill, 575 Madison Ave., New York 22, N. Y., archts. CD 5/19/53, under CA.

Alexander Barbe & Stevens, Inc., Weymouth St., Thompsonville, Conn., Owner Builds, $560,000 47 ranch type RESIDENCES, Weymouth Tract, Rte. 5, ENFIELD, CONN.

▲ **W. J. Megin, Inc.**, 51 Elm St., Naugatuck, Conn., CA, $4,000,000, 3 story, 281,000 sq. ft., WAREHOUSE, Rubber Ave., NAUGATUCK, CONN. U. S. Rubber Co., Footwear Div., 50 Maple St., Naugatuck, Conn. Bids May 24. CD 5/11.

Shepard Hills Construction Co., 2270 Whitney Ave., Hamden, Conn., Owner Builds, $810,000. 3 story, bsmt., 92x180 ft., brick, APARTMENT HOUSE, Prospect St., NEW HAVEN, CONN. Ryder Struppmann & Neumann, 163-18 Jamaica Ave., Jamaica, L. I., archts.

Green Manor Estates, Inc., 685 Parker St., Manchester, Conn., CA, $560,000, 58 RESIDENCES, Rood Ave. east of Matianuck Ave., WINDSOR, CONN. Rood Manor Estates, c/o contractor.

MIDDLE ATLANTIC

BIDS ASKED—BUILDINGS

† **D. C., Wash.**—PENTHOUSE—BA 6/23—Dist. P. Wks. Office, Potomac River Naval Command, Naval Gun Factory, altering west penthouse Building 30 Naval Research Laboratory, Bellevue, Contract NOY 83670. Plans deposit $10.

N. J., New Lisbon—DORMITORY UNIT—BA 6/24—State Div. of Purchase & Property, State House, Trenton, general construction of dormitory unit at State Colony. Plans deposit $25. CD 3/2/53.

N. J., New Brunswick—SERVICE BUILDING—BA 6/29—Rutgers University, Old Queens Bldg., New Brunswick, general construction of service bldg. on the campus of N. J. College for Women. Plans deposit $100. Kelly & Gruzen, 744 Broad St., Newark, N. J., archts. CD 12/21/45.

† **Pennsylvania**—ANTI-AIRCRAFT BLDGS., etc.—BA On Or About 6/25—U. S. Eng., 121 N. Broad St., Phila., Zone 1, (1) two 30x76 ft. mess halls; (4) (a), two 62x77 ft. underground ammunition storage structures (b) four 65x77 ft. underground ammunition storage structures, (5) two 30x40 ft. ammunition assembly bldgs. (6) two 20x41 ft. generator bldgs. (7) two 6x6 ft. acid storage sheds, (8) misc. structures such as hardstands, footings and two 3,500-lb. chain hoist davits (B) site imprvs., incl. clearing grubbing approx. 7 acres, grading for roads and site drainage, 775 sq. yd. c. conc. pavement, 19,700 sq. yd. gravel surfaced roads and parking areas, drainage pipe under paved areas, approx. 1,200 lin. ft. earth mounds, 15 ft. high (C) outside utilities, primary and secondary electrical distr. sys., four water supply walls, pumping equip. and distr. lines, 6 sewage collection sys. with septic tanks and tile fields for Anti-Aircraft Command, Site PH 15 CL at intersection State Rte. 413 and New Turnpike; Site 91 CL near intersection of Berks Rd. and Potshop Rd., Bucks and Montgomery Counties, Inv. No. ENG-36-109-54-392.

PROJECTS COVERED

By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $34,000; other public works $60,000; industrial buildings $82,000; other buildings $300,000. Also Foreign projects of $100,000 and more in size of interest to American contractors.

By Regions & Classes of Construction

(In order of Listing)

BIDS ASKED
LOW BIDDERS
CONTRACTS AWARDED

New England
Middle Atlantic
South
Middle West
West of Mississippi
Far West

PROPOSED WORK

Water Supply
Sewers, Waste Disposal
Bridges
Streets & Roads
Earthwork, Waterways
Public Buildings
Mass Housing
Commercial Buildings
Industrial Buildings
Unclassified

In These Stages

PROPOSED WORK: Before and including appointment of engineers or architects.
BIDS ASKED: BA (new announcements only). For full calendar, see also preceding issues.
LOW BIDDERS: LB On jobs below $500,000 in value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.
CONTRACTS AWARDED: CA Except awards to low bidders previously reported in low bidder stage.

CD dates shown are of Construction Daily issue in which last previous report was published.

Symbols and Abbreviations Include:

† Federal Government
▲ Project of $1,000,000 or over.
ENR Engineering News-Record
CD Construction Daily

For additional reports see Construction Daily.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

Corson & Gruman, 33 and K Sts. N. W., Wash., D. C. LB, $474,285, paving roadways of S. Dakota Ave. N. E. from Bladensburg Rd. to N. Y. Ave. and from N. Y. Ave. N. E. from S. Dakota Ave. to Park Line, Wash., D. C. D. C. Govt. Dpt. Hys., 499 Pax. Ave. N. W., Wash., D. C. Bids May 28. CD 5/24.

MARYLAND—State Rds. Comn., 108 E. Lexington St., Baltimore, Zone 2,

Wilmouth Paving Co., First and P Sts. S.W., Wash., D. C. LB $795,765. paving, 1.567 mi. relocation of River Rd. Rte. 201 incl. constr. of interchange ramps and concrete culvert, Contr. P 724-8-320, Prince George Co.;

Hechler Bros., Inc., Highland Springs, Va. LB $730,109, grading, drainage, surf. 4.486 mi. Centerville-Warwick Rd., Contr. Q-168-26-220, Queen Anne Co. Bids May 27. CD 5/12.

▲**Consolidated Eng. Co.**, 20 E. Franklin St., Baltimore, Md. CA $2,264,510. marginal wharf and warehouse facilities concrete, steel, block, BALTIMORE, MD. National Can Co., 811 S. Wolfe St., Baltimore, Md. CD 6/4, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Caye Constr. Co., Inc.**, 356 Fulton St., Brooklyn 1, N. Y., general constr.;

Gillman-Rous-Pesce Corp., 236 E. 47 St., New York, 17, N. Y., CA plumbing, heating and air-conditioning;

T. Frederick Jackson, Inc., 25 W. 43 St., New York, N. Y., CA electrical work 9 story HOSPITAL, Main St., FLUSHING, N. Y. Salvation Army, Inc., 120 W. 14 St., New York 11, N. Y. Total CA $3,244,112. CD 3/5.

▲ **Stone & Webster Eng. Corp.**, 49 Federal St., Boston, Mass. CA. engineer-architect services for nuclear part of the pressurized water reactor at GENERATING PLANT at Shippingport, near PITTSBURGH, PA. (sub-contractor under Westinghouse Electric Corp., Union Bank Bldg., Pittsburgh, Pa.) for Duquesne Light Co., 435 Sixth Ave., Pittsburgh 6, Pa. CD 3/17, under CA.

Davis, Wick, Rosengarten, 613 15 St. N. W., Wash., D. C. CA, $500,000, 6 story brick, stone, concrete OFFICE BLDG., 2320 N. St. N. W., WASH., D. C. Madana Realty Co., Inc., 1239 24 St. N. W., Wash., D. C., Maurice May, 1223 Connecticut Ave. N. W., Wash., D. C., archt.

SOUTH

BIDS ASKED—HEAVY CONSTRUCTION

† **Va., Portsmouth**—BA 6/22—P. Wks. Office, Fifth Naval Dist., U. S. Naval Base, Norfolk, Zone 11, paving, U. S. Naval Hospital, NOY 84400, Spec. 42757. Plans deposit $10.

† **Va., Norfolk**—INCREASE SUB-STATION CAPACITY, etc.—BA 6/22—P. Wks. Office, Fifth Naval Dist., U. S. Naval Base, Zone 11, increase sub-station capacity and electrical service bldg. N-26, Naval Base, NOY 84405, Spec. 42758. Plans deposit $10.

† **N. C., Jacksonville**—LIGHTING—BA 6/24—P. Wks. Office, Fifth Naval Dist., U. S. Naval Base, Norfolk 11, Va. rehabilitation airfield lighting, U. S. Marine Corps Air Facility, New River, NOY 83195, Spec. 41881. Plans deposit $10.

BIDS ASKED—BUILDINGS

Fla., Fort Myers—HOSPITAL—BA About 8/1—Lee Memorial Hospital, Fort Myers, hospital, Plans deposit $50. Chas. H. McCauley Jackson Bldg., Birmingham, Ala., archt. CD 10/29/53, under LB.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

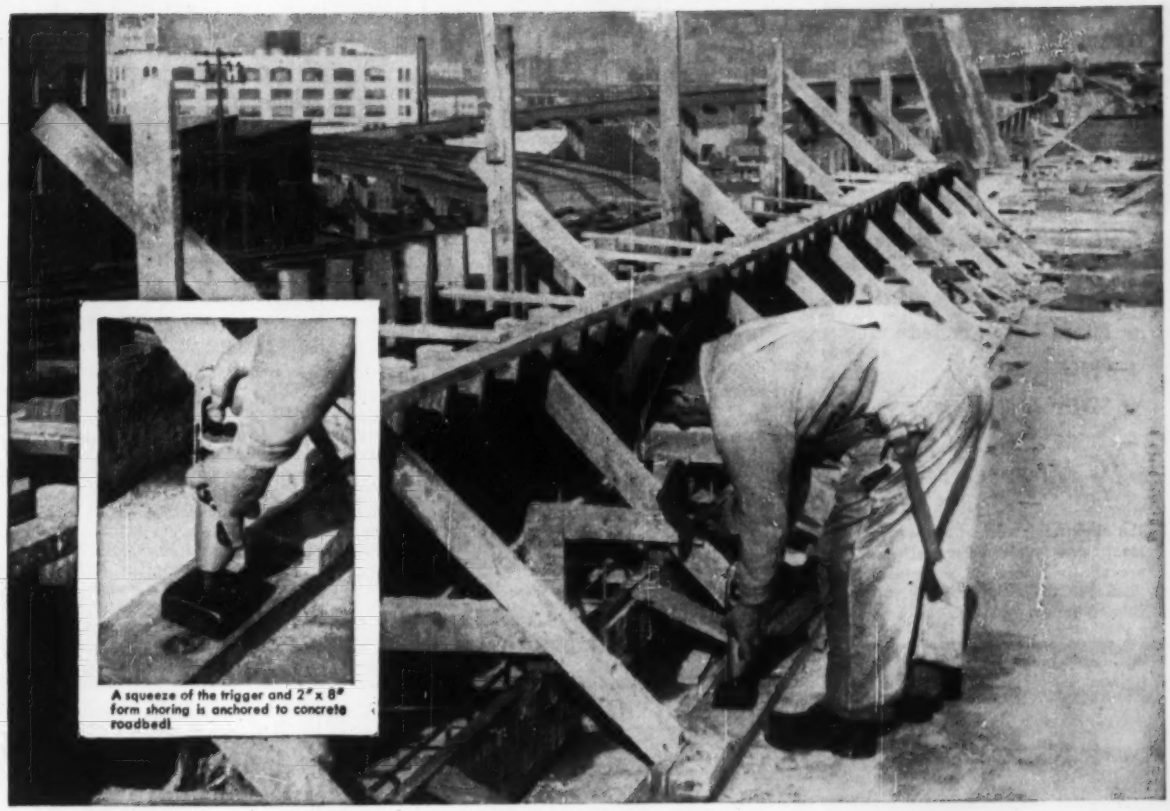
† **City Constr. Co.**, P. O. Box 208, Portsmouth, Va., LB $449,998, NIKE I, guided missile defense facility, Hampton, VIRGINIA. U. S. Eng., Foot of Front St., Norfolk, Va. Leon Chatelain, Jr., 1632 "K" St. N.W. Wash., D. C., archt. Bids June 3. CD 5/14.

WEST VIRGINIA—State Road Comn., 1800 Washington St. E., Charlestson,

C. E. Weatherall Co., 3114 Third St., Huntington, W. Va. LB, $79,342 1.23 mi. Proj. S-228 (2), Tucker Co.;

Anderson, Inc. and W. Va. Black Rock Co., 8 Spring St., Charleston, W. Va., CA, $132,810. 2.068 mi. State Proj. 3398, Kanawha Co.;

Standard Asphalt & Tar Co., 1640 4 Ave., Charleston, W. Va. LB, $299,796, 3.804 mi. F-29 (4) Ritchie Co. Bids May 28. CD 5/12.



A squeeze of the trigger and 2" x 8" form shoring is anchored to concrete roadbed

REMINGTON STUD DRIVER speeds fastening job on West Coast Highway

TEMPORARY ANCHORING OF FORMS TO CONCRETE can be time-consuming and costly—but it wasn't that way on the new San Francisco Freeway. Here, the Remington Stud Driver did the job in record time by setting up to 5 fastening studs per minute!

The forms were used for pouring the Freeway's railings and curbings after the concrete roadbed had set. A workman simply moved down the base strip with the Stud Driver, and it was securely fastened! When the curbing was in, the forms were removed and the studs broken off below the concrete surface. The small craters that remained were smoothed over with grout.

SAVINGS UP TO 80% IN FASTENING COSTS ARE NOT UNCOMMON with the Remington Stud Driver. Its speed, light weight (6 lbs.), and freedom from wires and hose make it ideal for all kinds of construction fastening. Find out how *you* can save with this powder-actuated tool by mailing the coupon below.

"If It's Remington—It's Right!"

Remington DUPONT

Listed & Approved by Underwriters' Laboratories, Inc.

QUESTIONS YOU ARE ASKING

QUESTION: What caliber cartridge powers the Stud Driver?

ANSWER: 32 caliber power loads are available in six grades, each designed for your specific fastening requirements.

MAIL THIS COUPON TODAY

Industrial Sales Division, Dept. E.N.R. -6
Remington Arms Company, Inc.
Bridgeport 2, Connecticut

Please send me a *free* copy of the new booklet showing how I can cut my fastening costs.

*Name*_____

*Position*_____

*Firm*_____

*Address*_____

*City*_____ *State*_____

MORETRENCH WELLPOINT SYSTEM

guarantees your freedom to

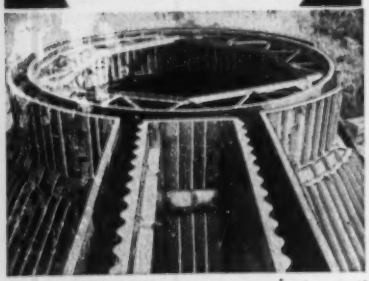
★ WORK unhampered by water
★ EXCAVATE by any method
★ PROGRESS fast
★ SAVE while doing it

"DIG IN THE DRY"

The Moretrench method and equipment are World famous and proved by years of experience. Send for the helpful Moretrench catalog today.

MORETRENCH CORPORATION
90 WEST STREET
NEW YORK 6, NEW YORK
Chicago, Ill. - Tampa, Fla. - Houston, Tex.

Reduce costs and INCREASE PROFITS by renting these metal forms for concrete



Economy Metal Forms save time, labor and material. They quickly lock together with a simple twist of a clamp. Standard units fit most jobs. Where needed, special forms can be fabricated to specification.

ECONOMY FORMS CORP.
Home Office: Des Moines, Iowa

DISTRICT SALES OFFICES: Kansas City, Mo. • Omaha, Neb. • Minneapolis, Minn. • Fort Wayne, Ind. • Cincinnati, Ohio • Cleveland, Ohio • Metuchen, N. J. • Springfield, Mass. • Decatur, Ga. Memphis, Tenn. • Dallas, Texas • Los Angeles, Calif. • Oakland, Calif. • Denver, Colo.

ECONOMY FORMS
metal forms for concrete construction

Smithson Constr. Co., 5400 Noyes Ave. S.E., Charleston, W. Va. CA, $84,000, steel TV tower and control building, CHARLESTON, W. VA. WCHS TV 1111 Virginia St. East, Charleston, W. Va. Awarded Mar. 12. CD 9/12/44.

† **Merritt Dredging Co.**, 63 Rutledge Ave., Charleston, S. C., LB $49,875, maint. dredging, U. S. Naval Minecraft Base, NOY 83442, CHARLESTON, S. C. Dpt. Navy, P. Wks. Officer, Naval Base, Charleston, S. C. CD 7/15/49, under Unclassified.

† **Boyle Constr. Co.**, Sumter, S. C., LB $80,965, crash fire station and motor pool paving, Donaldson Air Force Base, No. 38-081-54-25, GREENVILLE, S. C. U. S. Eng., Custom House, Charleston, S. C. Bids June 1. CD 5/12.

▲† **Duval Engr. & Contg. Co.**, 1746 E. Adams St., Jacksonville, Fla., CA, $1,248,358, paving missile skid strip, Inv. 54-59, Patrick Air Force Base, COCOA, FLA. U. S. Eng., P. O. Box 4970, Jacksonville, Fla. Bids May 20. CD 5/12.

▲ **Sullivan, Long & Hagerty**, 2026 2 Ave., Bessemer, Ala. and **Moss Constr. Co.**, Box 983, Columbus, Ga., CA, $1,632,460, sewage treatment plant and sewerage lines, MONTGOMERY, ALA. City, City Hall, Montgomery, Ala. Bids Apr. 15. CD 5/5, under LB.

▲† **Albert Johnson**, 608 Foshay Tower, Minneapolis, Minn., and **Peter Kiewit Sons Co.**, Omaha, National Bank Bldg., Omaha, Neb. CA $3,777,337. reconstr. Lock No. 1 (Green River) operations bldg. and access road, Spottsville, Henderson Co., KENTUCKY. U. S. Eng., P.O. Box 59, Louisville 1, Ky. CD 6/2, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

C. H. Jimison & Son, Huntington, W. Va., LB, $840,755 3 story WARD Bldg. at Huntington Hospital for Insane, HUNTINGTON, W. VA. W. Va. Bd. Control, Capitol Bldg., Charleston, W. Va. Bids June 1. CD 5/14.

T. C. Brittain Co., Decatur, Ga., CA, $806,000. SCHOOL Projects, DECATUR, GA. De Kalb Co. Bd. Educ., Decatur, Ga. Bids Apr. 28. D 5/20, under LB.

▲ **Delta Constr. Co. & Paul H. Kesling**, Waycross, Ga., CA, $1,115,000, HOSPITAL, WAYCROSS, GA. Ware Co., Waycross, Ga. Bids May 25. CD 6/2, under LB.

▲ **S. J. Curry & Co.**, Albany, Ga., CA, $1,248,425, INFIRMARY for Senile Patients, State Hospital, CHATTAHOOCHEE, FLA. State Imprvt. Comn., Caldwell Bldg., Tallahassee, Fla. Bids May 27. CD 6/2, under LB.

R. M. Thompson Co., 712 Grand Central Ave., Clearwater, Fla., CA, $700,000, SHOPPING CENTER, CLEARWATER, FLA. Joseph Gross & Assocs., Cleveland St., Clearwater, Fla.

C. F. Wheeler, 810 N.W. 72 St., Miami, Fla. LB $915,000. MEDICAL SCIENCE BLDG. at Jackson Memorial Hospital, MIAMI, FLA. Dade Co., Court House, Miami, Fla. Bids May 25. CD 5/3.

▲ **R. M. Thompson Co.**, 712 Grand Central Ave., Clearwater, Fla., CA, $2,800,000, SHOPPING CENTER, ORLANDO, FLA. Joseph Gross & Assocs., Cleveland St., Clearwater, Fla.

Arnold Constr. Co., 7 Murray Bldg., Palm Beach, Fla., CA, $889,777, HOSPITAL, SANFORD, FLA. Seminole Co., Court House, Sanford, Fla. Bids May 20. CD 6/2, under LB.

Barksdale & LeBlanc, Box 1567, Baton Rouge, La. LB $659,000. 3 DORMITORIES at Louisiana State School for Blind, BATON ROUGE, LA. State, Dpt. Educ., 850 N. 5 St., Baton Rouge, La. Bids June 1. CD 5/12.

† **Shaw & Estes Constr. Co.**, 1407 S Akard St., Dallas, Tex., LB, $681,030, Propellant storage area at Redstone ARSENAL, Inv. 54-101, HUNTSVILLE, ALA. U. S. Eng., P. O. Box 1169, Mobile 7, Ala. Bids June 3. CD 5/12.

MIDDLE WEST

BIDS ASKED—HEAVY CONSTRUCTION

† **Wisconsin**—BA About 6/23—U. S. Eng., 1217 U. S. Post Office and Custom House, St. Paul 1, Minn., reconditioning roadway and parking area, Lock and Dam No. 4, Mississippi River at Alma, CIVENG-21-018-54-61.

† **Mich., Houghton**—COMMUNICATION STATION—BA 6/29—Civil Aeronautics Admin., Federal Office Bldg., Kansas City, Mo., airways communications station at Memorial Airport, incl. watchhouse, driveway, parking, cables, etc., 3-54-107.

▲ **Ind., Fort Wayne**—BA 7/9—Bd. P. Wks. and New York, Chicago & St. Louis R.R. Co., City Hall, grade crossing elimination project in city at Fairfield Ave., Ewing St., Harrison, Calhoun, Clinton, Lafayette, Columbia and Clay Sts. $8,000,000. Plans deposit $75. De Leuw, Cather & Co., 150 N. Wacker Dr., Chicago, Ill., engrs. CD 4/26.

BIDS ASKED—BUILDINGS

O., Ravenna—HIGH SCHOOL—BA 6/23—Bd. Educ., Southeast Local School Dist., R. D. 1, New Milford, high school in Portage Co. R. D. 2. Plans deposit $25. Kling & Frost, 661 Wick Ave., Youngstown, archts. CD 5/29/50.

O., Dayton—SCHOOL—BA 6/29—Bd. Educ. 232 N. Main St., Wogaman School addn. Plans deposit $15. John F. Surman, 509 W. Monument Bldg., archt. CD 3/24.

SPEED BULK MATERIAL HANDLING

SCOOT-CRETE

BUILT FOR THE TOUGH JOBS!

Scoot-Crete Model N-52, Pay Load, 3,000 lbs.

Scoot-Crete's heavy-duty, truck transmission stands up under th worst operating conditions; delivers maximum horsepower from the Wisconsin air-cooled engine to the heavy-duty, high-traction 7:50x10, 6-ply U.S. Royal tires. Scoot-Crete scoots 3,000 lb. loads up 25% grades, in plants and at construction sites, has caster steering—turns in its own 90" over-all length. Dump box body interchangeable with flat rack in a few minutes. Speeds, 1 to 15 mph. Model N-52 in 14, 16 cu. ft. capacities. Other Scoot-Crete models available in 8, 12, 20, 27 cu. ft. capacities. Also, available with Diesel Powered engine. Write today for specifications and performance facts.

GETMAN BROTHERS
Manufacturing Division
South Haven 2, Michigan

The BELMONT IRON WORKS

Engineers — Fabricators — Erectors
Contractors — Exporters
Cable address—Beliron
STRUCTURAL STEEL
BUILDINGS & BRIDGES
RIVETED — ARC WELDED
Shops: Eddystone, Pa.—Philadelphia, Pa. Royersford, Pa.

Main Office 22nd St. & Washington Ave. Philadelphia 46, Pa.

New York Office 44 Whitehall St., N. Y. 4, N. Y.

DRILLING CONTRACTORS

Diamond and Shot Core Borings
Dry Sample Borings
Grout Holes and Pressure Grouting
Foundation Testing for Bridges, Dams and other Heavy Structures

Manufacturers, also of Diamond Core Drilling Machines and complete accessory equipment, including all types of Diamond Drilling Bits. Ask for Bulletin 320.

SPRAGUE & HENWOOD, Inc.
Dept. E, Scranton 2, Penna.

▲ **Wis., Wauwatosa**—POWER PLANT, etc.—BA 6/24—Milwaukee County Institutions and Depts., J. W. Rankin, director, Wauwatosa, power bldg., 72x128 ft., boiler area, 47x60 ft., turbine area; $950,000; also furnishing, installing power piping, $425,000. Plans deposit $50. Pfeifer & Shultz, 702 Wesley Temple Bldg., Minneapolis, Minn., engrs. CD 8/2/51.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

Jack LaCoste Co., Natl. City Bank Bldg., Cleveland, O., LB **$94,281**, est. $114,415, four-lane bridge, N. Arlington St. and E. North St., AKRON, O. Comrs. Summit Co., Court House, Akron, O. Bids May 25. CD 4/28.

Earl Newell & Son, Columbiana, O., CA. Approx. **$130,000**. water softening plant addn., increase capacity to 750,000 gal. daily, COLUMBIANA, O. Bd. P. Affairs, Village, Columbiana, O. Awarded June 1. CD 12/16.

† **Gustav Hirsch Organization, Inc.**, 1347 W. Fifth Ave., Columbus, O., CA **$177,623**, est. $263,132, electrical distr. and apron grid duct wiring sys., Lockbourne Air Force Base Serial No. ENG 46-022-54-23. COLUMBUS, O. U. S. Eng., 237 Fourth Ave., Huntington 18, W. Va. Bids May 25. CD 5/10.

Charles F. McCurdy, Inc., 906 Main St., Cincinnati, O. CA **$814,209**, est. $1,065,000, water and gas lines in south sect. of HAMILTON, O. City, Hamilton, O. Bids May 17, awarded June 3. CD 6/1, under LB.

† **Grant Contg. Co.**, Greenville, O., CA, **$699,975** placing hydraulic fill in levee borrow pit Degognia and Fountain Bluff Levee and Drainage Dist. Proj. Item VI-A (2), CIVENG-23-065-54-105. Jackson Co., ILLINOIS. U. S. Eng., 420 Locust St., St. Louis 2, Mo. Bids May 21. CD 5/27 under LB.

L. W. Dailey Constr. Co., 1034 Oakland St., Fort Wayne, Ind., CA, **$87,217**, wid'n., resurf. Brooklyn Ave. from Miller Rd. south to S.R. 1 and 3, FORT WAYNE, IND. Bd. P. Wks., City Hall, Fort Wayne, Ind. Awarded June 1. CD 7/14/44.

WISCONSIN—State Hy. Comn., Madison.

Mathy Constr. Co., 508 Hoeschler Bldg., La Crosse, Wis., CA, **$219,224**, b. conc. 6.007 mi. Contract 1, Port Edwards-Wisconsin Rapids and South County Line-Wisconsin Rapids Road, S. T. Hys. 13, 54 and 73, Proj. U 6903 (1) and T 04-4 (11), Wood Co. Bids May 25. CD 6/1, under LB.

Federal Paving Corp., 925 E. Abert Pl., Milwaukee 12, Wis., LB, **$107,876**, conc. paving various streets CUDAHY, WIS. City, 3619 E. Clayton Ave., Cudahy, Wis. Bids May 28. CD 5/19.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Wilputte Coke Oven Div. Allied Chemical & Dye Corp.**, 40 Rector St., New York, N. Y. CA, $9,000,000-$10,000,000. Design and construct unit 8, COKE PLANT, 76 oven by-products coke plant at Campbell Works to carbonize approx. 1,800 tons coal a day and make 1,260 tons coke a day, CAMPBELL, O. Youngstown Sheet & Tube Co., Stambaugh Bldg., Youngstown, O.

Schrand, Inc., Losantiville Ave., Cincinnati, O. Owner Builds. **$750,000**. 50 one story, brick HOMES, new street off Hunt Rd., CINCINNATI, O. Wilken-Schrand & Wilkens, Union Terminal Bldg., Cincinnati, O. engrs.-archts. Awarded May 28.

Vincent Kroeger, 3730 Feldkamp St., Bridgetown, O. Owner Builds. **$735,000**. 49 one story, bsmnt. brick HOMES, off dessup Rd., CINCINNATI, O. Joseph Allen, 4638 Glenway Ave., Cincinnati, O. engr. Awarded June 1.

B-Z Homes, Inc., Greenwood, Ind., Owner Builds, **$450,000**, 50 new homes in Greenwood Manor addition, GREENWOOD, IND.

Harrison Park Homes Inc., Lawrence, Ind., Owner Builds, **$500,000**, another group of 50 new HOMES in Harrison Park, 48 and Franklin Rd., LAWRENCE, IND.

▲ **Karl H. Kettlehut**, Lafayette, Ind., LB, **$811,100** general contract, STUDENT UNION "B" COURTS, series of 8 housing units for 818 students; LB **$435,000**, foundation for Memorial Union Hall of Music Annex, LAFAYETTE, IND. Bd. Trustees, Purdue University, West Lafayette, Ind. Bids May 29. CD 5/13.

WEST OF MISSISSIPPI

BIDS ASKED—HEAVY CONSTRUCTION

Okla., Guymon—BA 6/24—City, Guymon, sewage disposal plant, outfall line. $125,000. Hatfield Engr. Co., Amarillo, Tex., engr. CD 11/9.

† **Kan., Topeka**—APRON ELECTRICAL SYS.—BA 6/25—U. S. Eng., 601 Davidson Bldg., Kansas City 8, Mo., apron electrical sys., FY-53 Phase II Forbes Air Force Base, Inv. 23-028-54-y9. CD 5/24.

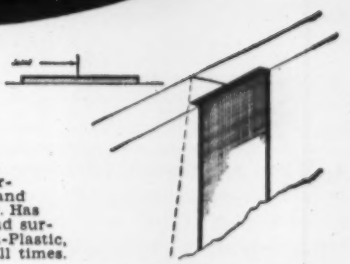
† **Neb., Fort Crook**—LIGHTING—BA 6/25—U. S. Eng., 1709 Jackson St., Omaha, medium intensity runway lighting, Offutt Air Force Base. Inv. 25-066-54-107. CD 5/22/52.

† **Colo., Denver**—RUNWAY ALTERATIONS, etc.—BA 6/29—Dpt. Navy, Ninth Naval District, Bldg. 1-A, Great Lakes Naval Training Station, Great Lakes, Ill., runway and taxiway alterations, Naval Air Station. A. J. Ryan & Assocs., 1340 Glenarm Pl., engrs. and archts. CD 1/23/53.

Tex., Mineral Wells—BA 6/29—City, John T. Beckworth, mayor, imprv. various streets. $60,000. Plans deposit $15. Joe J. Rady, 511 Insurance Bldg., Fort Worth, engr.

Servicised Premolded Para-Plastic* for Effective, Low Cost JOINT SEALING

TWO TYPES:

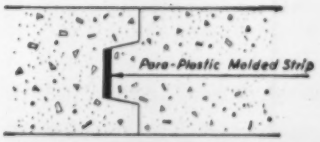


1. PARALATERAL Wide Strip

For sealing vertical construction or expansion joints in Retaining Walls, Abutments, Wing Walls, Foundations, etc., particularly when one side will be backfilled and protection from water seepage is necessary. Has rigid backing of asphalt joint material and surface and both edges coated with Para-Plastic, which maintains bond with concrete at all times.

2. MOLDED STRIP

Para-Plastic Sealing Compound is molded into strips for sealing keyed construction joints and cracks or breaks in vertical concrete surfaces. Concrete poured against the strip, after setting up, will bond with strip to form watertight seal.



Write for complete details on Servicised Products for the construction industry. See our Catalog in Sweet's.

*Para-Plastic is one of the many Patented products developed by Servicised Products Corp. for the construction industry.

SERVICISED PRODUCTS CORP.
6051 WEST 65th STREET • CHICAGO 38, ILLINOIS

Save Draftsmen's Time

YOUR TYPIST CAN DO THE JOB BETTER

Handles anything up to 12 feet!

The Vari-Typer lettering machine is the fastest and most economical method of lettering specifications on tracings and drawings. It is four to five times faster than hand lettering and is operated by an office typist. Every letter and figure is uniformly clear and distinct. Instantly changeable type, with hundreds of different styles to choose from in sizes ranging from 6 point to 18 point. Write today for information.

Vari-Typer Lettering Machine

Body copy produced on DSJ Model. Headlines photo-composed on the Headliner.

RALPH C. COXHEAD CORP.
720 Frelinghuysen Avenue.
Newark 5, N.J.

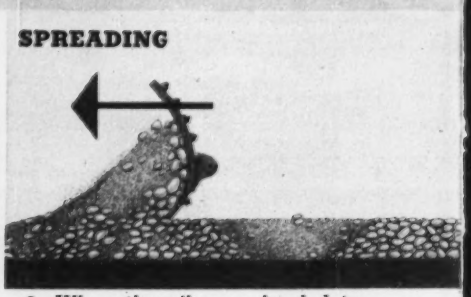
Please send Vari-Typer Book 19

NAME.....
COMPANY.....
ADDRESS.....
CITY.....ZONE...STATE...

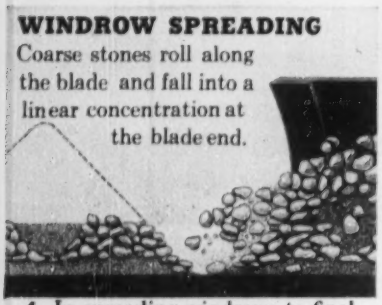
HOW GRAVEL SEGREGATION IS CAUSED . .

1. When aggregates are transported the bumping and vibration causes the fines (dust, small particles and chips) to sift to the bottom of the load while the larger stone works toward the top and sides.

2. When the load is dumped on the roadway, the material forms in piles. The larger stones roll from the truck first, the fines fall last. The segregated condition is now reversed; the coarse aggregates are in the base of the pile.

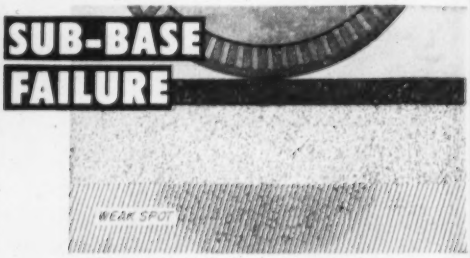


3. When the piles are leveled to specified depth, alternate pockets of fines and coarse are formed. Such segregation is highly unstable and a base course so constructed would soon ravel and break up.

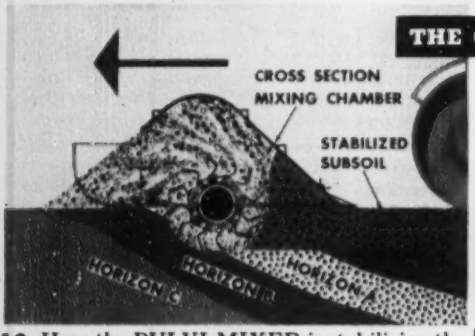


6. In spreading windrows to final crown and grade, a different but very unstable segregation is caused. Fines are found in concentration in the "heart" of the windrow. Some of these remain in a pocket; others sift to the bottom. Stones which are "topped" by the blade, are rolled to the surface.

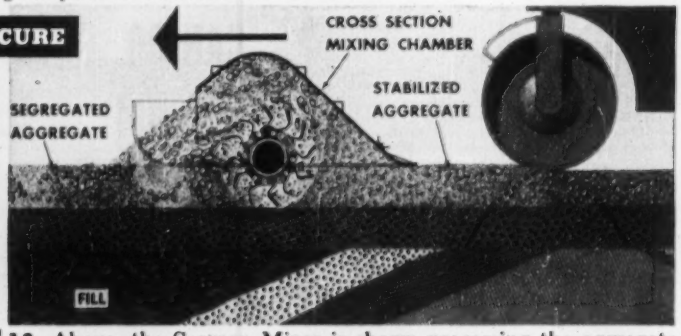
7. A road built with gravel in a segregated condition soon develops rippling, undulations, and a "wash-boardy" condition. Traffic keeps those non-keyed stones in motion. Rain trapped in the hollows seeps through and weakens base and sub-base. Freezing and thawing complete the destruction.



8. SUB-BASE failure is frequently caused by soils of different physical characteristics reacting unevenly to moisture. Here a weak spot is developing just below the base course. This would not occur if sub-base had been processed to blend the soils and eliminate voids.

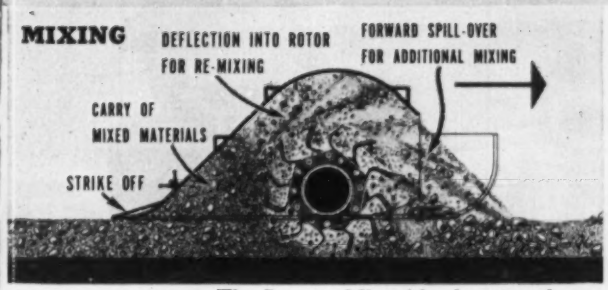


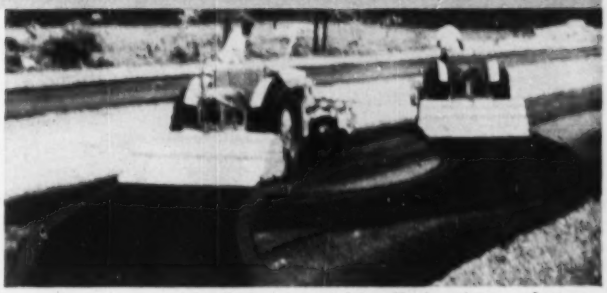
12. Here the PULVI-MIXER is stabilizing the sub-base by blending the sub-grade soil horizons (A, B, C,) to attain a course which is uniform in moisture, density and thickness. Weak spots such as that shown in the previous four diagrams will not occur and therefore the base will not require maintenance.



13. Above, the Seaman Mixer is shown processing the aggregate for the base, correcting an always-present segregated condition. The material has previously been shaped to final crown and grade. No further blading is needed, for the PULVI-MIXER not only completes the mix but also leaves it in a partially compacted condition, exactly to the grade established, ready for final rolling. This partial pre-compaction is needed because materials left too fluffy are subject to segregation during compaction.

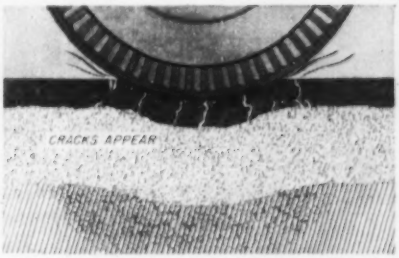
. . HOW THE SEAMAN MIXER CORRECTS IT

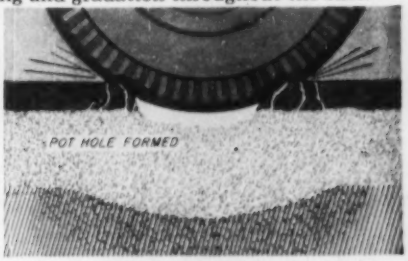




4. The Seaman Mixer blends out pockets of coarse and fines so that particles of each size, from dust up to the largest stone, are intermixed throughout the base. Voids are filled with fines to mortar-in the keyed and interlocked coarse material.

5. It is essential in eliminating pockets of coarse and fines to cross-mix as well as to mix in a longitudinal direction. Only the Seaman Mixer is capable of this operation which provides complete and uniform material placement, blending and gradation throughout the base.





9. The breakdown of the sub-base through the disintegrating effect of moisture is reflected in a localized movement of the materials in the base.

10. As traffic continues to pound the base, cracks develop and the sub-base is weakened further. Sub-base and base course deflections are unequal and the beam effect of the base is unable to carry the load.

11. Complete breakdown of the base course above the sub-base failure has started a chain reaction as more moisture will permeate the fault and establish repeated breakdown cycles along the width and length of the pavement.

For a complete description of the SEAMAN TRAV-L-PLANT and the SEAMAN Self-Propelled Mixer, write for Bulletin TPS. Send a postcard today.

SEAMAN MOTORS Inc.

281 No. 25th St.
Milwaukee 3, Wisconsin

SEAMAN TRAV-L-PLANT. Equipped with pump, tachometer, volumetric meter and spray bar for closely controlled application of bituminous binders or water.

120 barrel capacity Fruehauf Air-Slide Cement Transport is adaptable to most pulverized materials. Air-gravity method of discharge speeds up cement deliveries.

MOVE MATERIALS FASTER

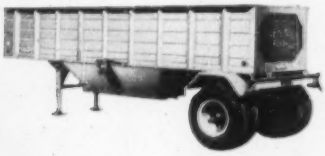
130 barrel capacity Fruehauf Twin-Screw Bulk Cement Trailer dumps full load of pulverized or powdered material in 15-20 minutes.

MAKE MORE MONEY!

YOU CAN do it with the Fruehauf construction equipment illustrated here. Why? Because this equipment is *designed* to move materials faster! First, it loads in less time. You're out of the yard minutes sooner. Second, it's built to haul bigger loads. Third, it can be unloaded in shorter time. All this adds up to more material moved per trip, more trips per day, more profit per job. Make us prove it by filling out and mailing in the coupon below.

Fruehauf Insulated Hot Asphalt Trailers

Fruehauf 12-30 cubic-yard Hopper-Type Tandem Dump Trailers



Fruehauf 6-20 cubic-yard Hopper-Type Single Axle Dump Trailers

Fruehauf 12-30 cubic-yard Hoist-Type Dump Trailers

Fruehauf 8-20 cubic-yard Hoist-Type Dump Trailers

Fruehauf Deep-Frame Steel and Aluminum Platform Trailers

FRUEHAUF TRAILER COMPANY, 10955 Harper Avenue, Detroit 32, Michigan

- ☐ Please send me the newest, completely illustrated free literature on Fruehauf's specialized construction units.
- ☐ Please have a Fruehauf salesman call at my office with a list of specifications of Fruehauf Trailers suitable to my business.

NAME_____ COMPANY_____

ADDRESS_____

CITY_____ STATE_____

FRUEHAUF TRAILERS
"ENGINEERED TRANSPORTATION"

FRUEHAUF BUILDS THE WORLD'S GREATEST LINE OF CONSTRUCTION TRAILERS

† **South Dakota**—BA 7/7—U. S. Eng., 1709 Jackson St., Omaha, Neb., station service control centers and convertible panel boards, Garvins Point Reservoir Proj. near Yankton, In. 25-066-54-182.

† **Nebraska**—FOUNDATIONS—BA 7/8—Bureau Reclamation, Dpt. Interior, Casper, Wyo., foundations, erect structural steel, install electrical equip. for Gering sub-station addns., Missouri River Basin Proj., Transmission Div., Spec. 703C-344.

† **North Dakota**—TRANSMISSION LINE APPROACH—BA 7/20—Bureau Reclamation, Dpt. Interior, Bismarck, const Garrison-Voltaire transmission line approach to Garrison switchyard and dismantling Garrison-Fort Peck temporary tie. Transmission Div., Missouri-Souris Dist., Missouri River Basin Proj., Mercer and McLean Counties. Spec. DC 4189; adv. ENR 6/17/54.

† **Ark., Blytheville**—FIRE STATION, etc.—BA 7/23—U. S. Eng., 300 Broadway, Little Rock, crash and structural fire station, guardhouse, water distr. mains, sewage treatment plant and sanitary sewer sys., Blytheville Air Force Base, $500,000. CD 12/1/53.

BIDS ASKED—BUILDINGS

Colo., Denver—SCHOOL—BA 6/23—School District No. 1, City and Denver Co., 414 14 St., 3 story, 140,000 sq. ft., brick, steel Roscoe Hill, Junior High School at E. 4 and E. 5 at Ash and Clermount Sts. Over $300,000. Raymond H. Ervin, Patterson Bldg., engr. and archt. CD 10/10/52.

Minn., Owatonna—CHURCH—BA 6/24—Trinity Lutheran Church, Owatonna, church, parish house, $300,000, LeRoy Gaarder, Alberta Lea, archt. CD 5/18.

† **Tex., Marshall**—SHOP—BA 6/24—U. S. Eng., Box 61, Tulsa 2, Okla., battery shop and maintenance repair shop, for Longhorn Ordnance Work, Plant No. 2. Inv. No. ENG-34-066-54-93. Approx. $100,000. CD 8/25/52.

Mo., Independence—SCHOOL—BA 6/25—Bd. Educ., School Bldg., Ott Elementary School, $480,000, E. M. Fuller, 701 E. 14 St., Kansas City, Mo., archt. CD 11/30/53.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

MINNESOTA—State Hy. Dpt., 1246 University Ave., St. Paul,

Mark Sand & Gravel Co., Fergus Falls, Minn. CA **$224,316** grav. base, plant-mixed bit. surf. 13.6 mi. between Barnesville and 13.6 mi. southwest, Clay and Wilkin Counties. Bids May 21. CD 5/6.

P. Lametti Constr. Co., 615 Drake St., St. Paul, Minn. and **Lametti & Sons**, 211 North Pascal St., St. Paul, Minn. CA **$533,826**. sanitary sewers, GOLDEN VALLEY (P.O. MINNEAPOLIS), MINN. Village, K. W. Rahn, clk., Golden Valley, Minn. CD 4/21, under LB.

Orfei & Mariani, 1156 Homer St., St. Paul, Minn. CA **$624,523**. furnish, install, 101,000 lin. ft. 9 in. vitr. clay pipe, RICHFIELD (P. O. Minneapolis), MINN. Village, P. H. Haugen, clk., Richfield, Minn. CD 6/2, under LB.

▲ **IOWA**—State Hy. Comn., Ames,

Booth & Olson, 529 Insurance Exchange Bldg., Sioux City, Ia., LB, **$617,722** paving 6.974 mi. F-218 (1), Clay Co.; LB **$72,501**, paving 0.273 mi. FN-964 (3), Fremont Co.; LB **$822,557**, paving 13.484 mi. F-2 (10), Woodbury Co.; LB **$269,057**, paving 1.869 mi. U-2 (4), Woodbury Co.;

Jensen & Krage, 2220 Hawkeye Dr., Sioux City, Ia., LB, **$141,384**, paving 0.93 mi. FN-44, Cass Co.;

Hallett Constr. Co., Crosby, Minn., LB, **$69,307**, pavement wid'n., resurf. 0.601 mi. FN-380 (9) Bremer Co.;

H. F. Schroeder Sons, Carroll, Ia., LB, **$60,015** grading 5.958 mi. S-2222 (1), Audubon Co.; LB **$68,800**, grading 5.978 mi. F-1029 (1), Carroll and Greene Counties;

R. B. Burch, Inc., 249 33 St. Dr. S.E., Cedar Rapids, Ia., LB, **$78,434**, grading 8.632 mi. F-754 (5), Louisa Co.;

Ira Van Burkirk & Sons, Hawarden, Ia., LB, **$114,007** grading 7.637 mi. Special F-1003 (3), Plymouth and Sioux Counties;

Erwin Clark Constr. Co., Logan, Ia., LB, **$260,533** stab. base and bit. 9.239 mi. FN-356, Harrison Co.;

Kaser Constr. Co., 219 5 St. West Des Moines, Ia., LB, **$394,387**, stab. base and bit. surf. 14.119 mi. FN-359, Monroe and Wapello Counties;

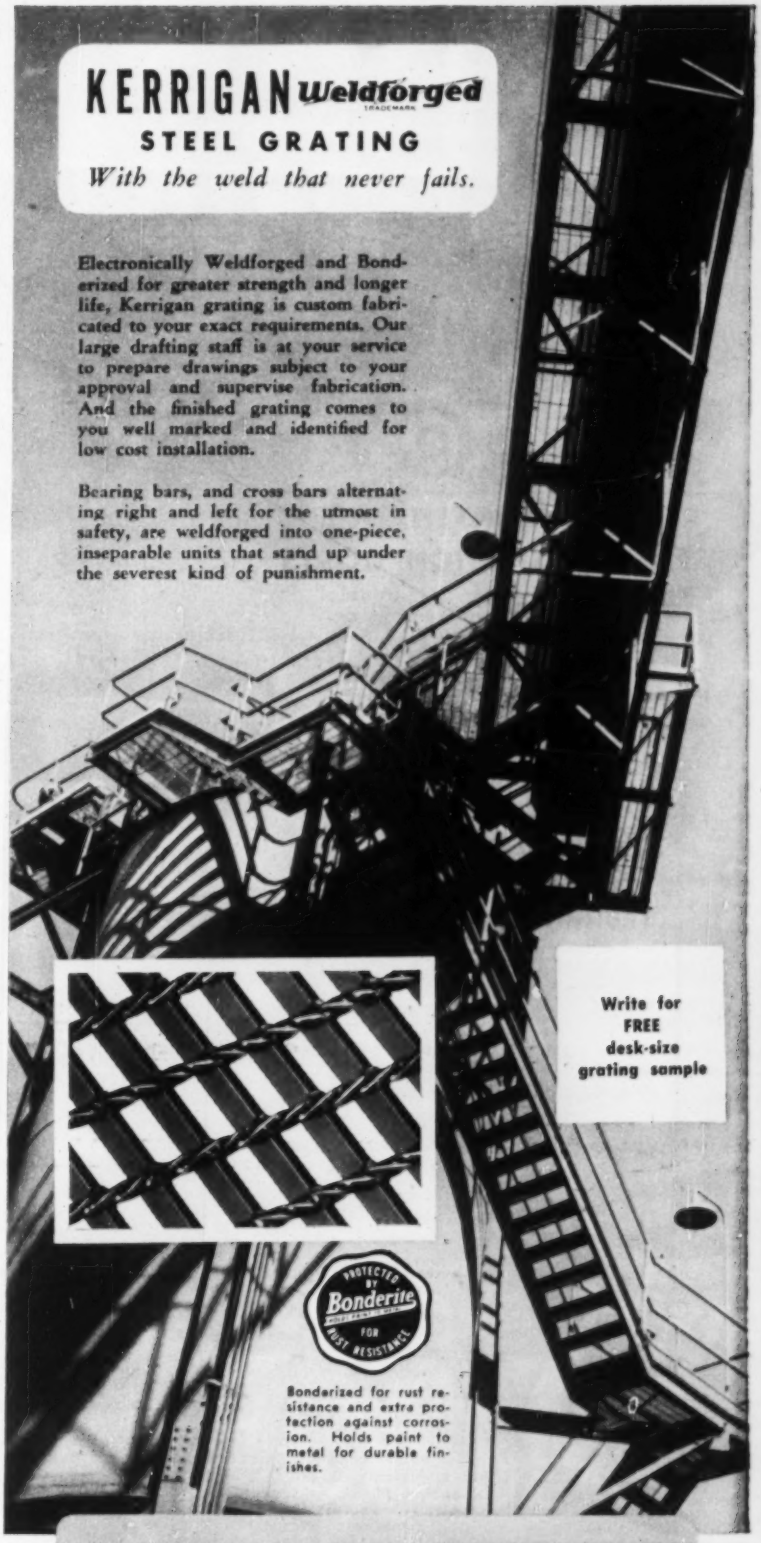
Greene Limestone Co., Greene, Ia., LB, **$264,665** stab. base and bit. 8.789 mi. Special FN-338 Muscatine Co. Bids June 1. CD 5/19.

J. S. Alberici Constr. Co., 1550 Irving Ave., St. Louis 20, Mo. CA **$947,120**. addnl. storage basin conduits for Howard Bend water pumping station on Missouri River to increase capacity of plant from 80 to 120 m.g. per day, ST. LOUIS, MO. City, Frank J. McDevitt, pres. Bd. P. Service, 304 City Hall, 12 and Market Sts., St. Louis 3, Mo. Bids May 18, awarded May 25. CD 5/25, under LB.

† **Associated Eng. Co.**, Fond du Lac, Wis. LB **$117,867** on c.i. est. $150,000, **$94,293** on steel est. $180,000. underground gas distr. sys. lines wrapped with cathodic protection installed in place, move regulators from bsmnt. to second floor in 10 bldgs., St. Louis Ordnance Plant, ENG-23-028-54-169, ST. LOUIS, MO. U. S. Eng., 601 Davidson Bldg., Kansas City 8, Mo. Bids May 27. CD 5/10.

† **U. S. Eng.**, 1709 Jackson St., Omaha, Neb. received no bids June 2, surf. access road and parking at Gavins Point Reservoir Proj., near Yankton, Inv. 25-066-54-172, SOUTH DAKOTA. CD 5/27.

Knipp Bros., Tipton, Mo. CA **$73,500** raising strengthening of levee, CARROLLTON, MO. Sambo Slough Levee Dist., Carrollton, Mo. Bids May 19.

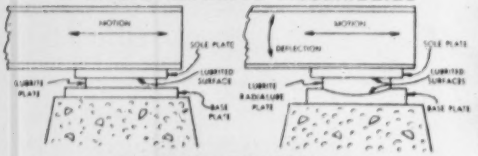

KERRIGAN Weldforged
TRADEMARK
STEEL GRATING
With the weld that never fails.
Electronically Weldforged and Bonderized for greater strength and longer life, Kerrigan grating is custom fabricated to your exact requirements. Our large drafting staff is at your service to prepare drawings subject to your approval and supervise fabrication. And the finished grating comes to you well marked and identified for low cost installation.
Bearing bars, and cross bars alternating right and left for the utmost in safety, are weldforged into one-piece, inseparable units that stand up under the severest kind of punishment.
Write for FREE desk-size grating sample
PROTECTED BY Bonderite FOR RUST RESISTANCE
Bonderized for rust resistance and extra protection against corrosion. Holds paint to metal for durable finishes.
KERRIGAN IRON WORKS, Inc.
General Sales Office — 274 Madison Ave. — New York City

Assured
SELF LUBRICATING SECURITY
With **Lubrite**
EXPANSION PLATES & BUSHINGS

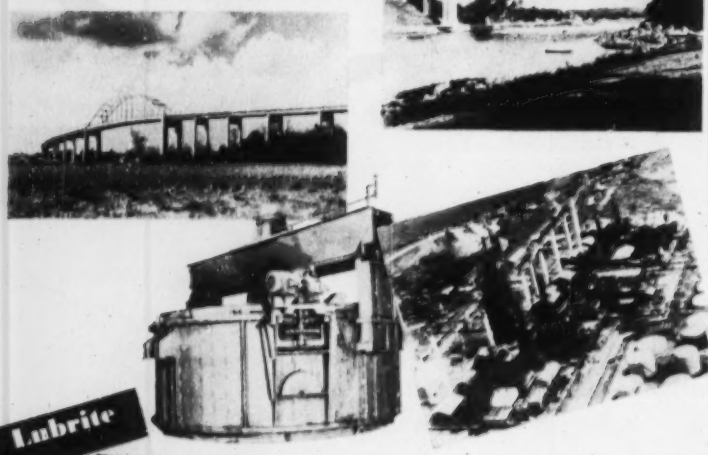
SIMPLIFY DESIGN
REDUCE MAINTENANCE
CUT CONSTRUCTION COSTS

Lubrite offers a clear-cut, trouble free solution for bridge bearing expansion and/or rotation problems.

2 BASIC LUBRITE ASSEMBLIES



ROCKER BEARINGS
EXPANSION SHOES
HANGER BEARINGS
TRUNNION BUSHINGS



Send for this free 20-page Lubrite Manual No. 55 — it contains complete information, technical data and specifications about Lubrite Self-Lubricating Expansion Plates and Bushings. Write today!

Manufactured Exclusively by
MERRIMAN BROS., INC.
189 Amory Street, Boston, Mass.

KANSAS—State Hy. Comn., Dodge City.
L. F. Harper Constr. Co., Great Bend, Kan. CA **$71,796**. grading 9.424 mi., Proj. 505-29 F 050-2 (6), Ford Co. Bids May 27. CD 5/13.

† **Dondlinger & Sons Constr. Co.**, 1206 E. Lincoln St., Wichita, Kan. CA **$611,746**. Group "L" bldgs., Wichita Air Force Base, Inv. 23-028-54-67, WICHITA, KAN. U. S. Eng., 601 Davidson Bldg., Kansas City 8, Mo. CD 6/2, under LB.

Ideco Division, Dresser-Stacey Co., 875 Michigan Ave., Columbus, O., CA 1,572 ft. high television tower, triangular in cross sect., 12 ft. on a side, OKLAHOMA CITY, OKLA. Television Station KWTV, 2701 First Natl. Bldg., Oklahoma City, Okla. CD 8/21/52.

Colorado Valley Co-operative, Schulenburg, Tex. Own Forces. **$175,000**, stringing some rural pole telephone lines, Schulenburg, Fayette Co. TEXAS.

Victoria County Electric Co-operative, Victoria, Tex. Own Forces. **$90,000**, rural electric lighting sys. imprvs., rehabilitation and some new lines, Victoria Co. TEXAS. CD 5/6/53.

† **Lufkin Constr. Co.**, Lufkin, Tex., CA **$744,736**. refueling hydrant sys., at Abilene Air Force Base, ENG-41-443-54-64, ABILENE, TEX. U. S. Eng., 100 W. Vickery St., Fort Worth, Tex. Bids May 27, awarded May 30. CD 6/2, under LB.

† **Clark & Cobb**, Denton, Tex., LB **$138,752**, est. $135,131, mission staging bldg., Connally Air Force Base, ENG-41-443-54-68, WACO, TEX. U. S. Eng., 100 W. Vickery St., Fort Worth, Tex. Bids June 2. CD 5/18.

COLORADO—State Hy. Dpt., State Office Bldg., Denver.
L. H. Kilgore, 7991 W. 6 Ave., Denver, Colo., CA, **$288,068**, est. $297,275, 0.83 mi. State Highway No. 1, between Monument and Colorado Springs, Colo. Proj. I 002-2 (27), El Paso Co. Bids May 27, awarded May 28. CD 5/21.

† **Burks & Co.**, 843 East 17 Ave., Denver, Colo., LB, **$174,272**, est. $192,031, earthwork, structures for Boulder Creek Supply Canal, Station 664 plus 38.5 to 862 plus 86, Colorado-Big Thompson Proj., Spec. DC 4150, COLORADO. Bureau Reclamation, Dpt. Interior, Loveland, Colo. Bids Mar. 27. CD 4/30.

Western Paving Constr. Co., 5105 Washington St., Denver, Colo., CA, $71,407, est. $162,100 c. conc. and b. conc. Street Paving District No. 1008, DENVER, COLO. City and Denver Co., City and County Bldg., Denver, Colo. Bids May 27. CD 5/21.

BUILDINGS

LOW BIDS AND CONTRACTS

Standard Constr. Co., 250 Builders Exchange Bldg., Minneapolis, Minn. CA **$281,486**. general contract HIGH SCHOOL addn., OWATONNA, MINN. Bd. Educ., Mrs. Vera Hinderman, clk., Owatonna, Minn. Contract let on modified plans. CD 3/24, under LB.

Bank Building & Equipment Co., 906 Sidney St., St. Louis, Mo. LB Est. **$300,000**. 1 or 2 story, bsmnt., brick, concrete BANK, 8 and Cherry Sts., COLUMBIA, MO. Columbia Savings Bank, Ninth and Broadway, Columbia, Mo. CD 6/2.

† **Schultz & Lindsay Constr. Co.**, 621 First Ave. N., Fargo, N. D., LB **$82,124**, est. $108,279, 60x120 ft. GARAGE and WAREHOUSE for Fargo Sub-station, Spec. DC 4162, Missouri River Basin Proj. Transmission Div. NORTH DAKOTA. Bureau Reclamation, Dpt. Interior, Bismarck, N. D. Bids May 26. CD 4/22.

Metcalfe Constr. Co., Omaha Natl. Bank Bldg., Omaha, Neb., CA **$120,000**. GARAGE, OMAHA, NEB. Capitol Garage, A. H., P. M. and L. D. Golstein, 202 N. 19 St., Omaha, Neb. C. A. Martin & Assocs., Karbach Block, Omaha, Neb., archts.

Chalmers & Borton, Hutchinson, Kan. CA **$150,000**. GRAIN ELEVATOR addn., BUCKLIN, KAN. Bucklin Co-operative Exchange, Bucklin, Kan.

Johnson-Brachter Constr. Co., Salina, Kan. CA **$150,000**. GRAIN ELEVATOR Addn., SALINA, KAN. Robinson Milling Co., Salina, Kan.

Tillotson Constr. Co., 1215 Jones St., Omaha, Neb. CA **$175,000**. GRAIN ELEVATOR ADDN., TRIBUNE, KAN. Greeley County Grain Co., Tribune, Kan.

Southwest Constr. Co., Box 5103, Donaldson Station, Tulsa, Okla., CA **$118,800**. est. $125,000. WAREHOUSE, office at Boulder Park Rd., TULSA, OKL. Schermerhorn Oil Co., First Natl. Bldg., Tulsa, Okla. Awarded June 3.

▲ **The Campbell Corp.**, Wright Bldg., Tulsa, Okla., Purchase and Hire. **$7,000,000**. 404-unit HOUSING proj., 41 and Yale Sts., TULSA, OKLA. Max W. Campbell, Wright Bldg., Tulsa, Okla., engr. Awarded June 1.

▲ **Red Bud Development Co.**, Admiral Blvd., 105 St., Tulsa, Okla., Purchase and Hire. Approx. **$1,000,000**. 300 HOUSES for Wagon Wheel Addn. at 105 St., TULSA, OKLA. R. W. Skinner, c/o owner, engr. Awarded June 2.

Riedesel-Lowe Constr. Co., Box 914, Cheyenne, Wyo., LB **$987,789**, 102-addnl. bed, 4 story, bsmnt., brick hospital addns. and remodeling, CASPER, WYO. Natrona County Hospital Assn., Casper, Wyo. Bids May 27. CD 5/13.

▲ **M. W. Watson**, National Bank of Topeka Bldg., Topeka, Kansas, CA **$1,355,800**, general contract;

W. R. Johnson, Grand Junction, Colo., CA, **$318,573**, plumbing and heating work; 1 and 2 story HIGH SCHOOL, GRAND JUNCTION, COLO. School District No. 51, Mesa Co., Grand Junction, Colo. Bids May 25, awarded May 26. CD 5/4.

† **George A. Rutherford, Inc.**, Box 771, Albuquerque, N. M. LB **$261,119**, AMMUNITION NORMAL MAINT. FACILITIES; LB **$114,995**, underground utilities, water, sewer, steam, electric lines, pole, Wingate Ordnance Depot, Serial No. ENG-29-005-54-111, GALLUP, N. M. U. S. Eng., Box 1538, Albuquerque, N. M. Bids May 27. CD 5/12.

7,000 ITEMS A KEY TO K&E LEADERSHIP

Drafting, Reproduction, Surveying,
Optical Tooling Equipment and Materials
Slide Rules Measuring Tapes

● **Since 1867 engineers, scientists, designers, surveyors, draftsmen have relied on K&E as the foremost, most progressive, and most complete source of supply for the tools, equipment, and materials they work with. When you buy, think first of K&E, headquarters for 7,000 items. For example . . .**

JIG ALIGNMENT TELESCOPE—This K&E instrument can align a jet plane's wings to within a thousandth of an inch. It establishes optically a line of sight from which measurements can be made and parts positioned with a degree of precision not otherwise possible.

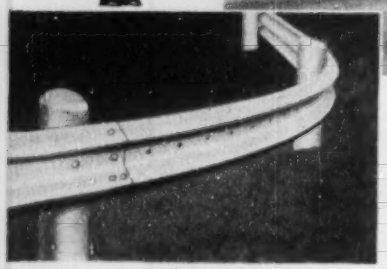
Such developments in Optical Tooling equipment are a combination of eighty-seven years of K&E skill and experience with forward looking research and development in all the fields served by K&E.

KEUFFEL & ESSER CO.

New York • Hoboken, N. J.

Chicago • St. Louis • Detroit • San Francisco • Los Angeles • Montreal
Distributors in Principal Cities

Are *Curves* bothering you in specifying beam type guard rail?



U·S·F
Barrier-Beam
HIGHWAY GUARD RAIL

Yes, indeed, USF Barrier Beam has the dependable strength and impact resistance of a beam section. Nevertheless, designing it for curves is easy. Straight sections are all you need for curve radii of 150′ or over. Shop forming for any radius from 20′ r to 150′ r is readily available.

Erection is simple, for no tension is involved, and no special tools or attachments are needed.

If curves are troublesome, specify rugged USF Barrier-Beam. Its ease of installation and maintenance make it a natural for straightaways, too.

Write for Full Details.

USF
USS STEEL
UNITED STEEL FABRICATORS, INC.
WOOSTER, OHIO
PRODUCTS Hollow Metal Doors • Prefabricated Metal Buildings • Window Wells
Highway Guard Rail • Bridge Flooring • Corrugated Metal Pipe

"Gunite" ..... the sand-cement product of the "CEMENT GUN," for Concrete and Masonry Repairs, Pre-Stressed Tanks, Steel Encasement and for lining Reservoirs, Sewers and Tunnels.

CEMENT GUN COMPANY
"GUNITE" CONTRACTORS
GENERAL OFFICES—ALLENTOWN, PENNA., U.S.A.
MANUFACTURERS OF THE "CEMENT GUN"

FAR WEST

BIDS ASKED—HEAVY CONSTRUCTION

† **Oregon**—SUBSTATION ADDNS.—BA 6/30—Bonneville Power Admin., 1001 N. E. Lloyd Bldg., Portland, 230 and 69 kv addns., Redmond Substations, Deschutes Co. Inv. 7398. Plans deposit $25.

† **California**—BA 7/6—Bureau Reclamation, Dpt. Interior, Denver Federal Center, Denver, Colo., Schedule 1, Item 1, gate frames and Item 2, anchor bolts, for Outlet works at Monticello Dam, Solano Proj. Spec. DS4184. L. N. McClellan, ch. engr. CD 7/31/52.

† **Idaho**—BA 7/6—Bureau Reclamation, Dpt. Interior, Bldg. 1 A, Denver Federal Center, Denver, Colo. valves with control units and handling equip., equipment, and anchor bolts for outlet works at Palisades Dam, Palisades Proj., Spec. DS 4186. L. N. McClellan, ch. engr. CD 9/14/44.

† **Arizona**—SWITCHES, etc.—BA 7/8—Bureau Reclamation, Dpt. Interior, Bldg. 1 A, Denver Federal Center, Denver, Colo., interrupter switches, disconnecting switches and horn-gap switches for Gila Substation, Davis Dam Proj., Spec. DS 4185. L. N. McClellan, ch. engr.

† **Arizona-Nevada**—BA 7/27—Bureau Reclamation, Dpt. Interior, Bldg. 53, Denver Federal Center, Denver, Colo., generator (Unit N-8) for Hoover Power Plant, Boulder Canyon Proj. Spec. DC 4144. Extended date. CD 5/20.

BIDS ASKED—BUILDINGS

† **Calif., Los Angeles**—BUILDING ALTERATIONS—BA 7/13—Veterans Admin., Munitions Bldg., Wash., D. C., building alterations at Veterans Administration Center. CD 5/17, under LB.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

† **Industrial Electrical Service**, 210 W. Adams St., Phoenix, Ariz., LB, $100,020, est. $98,638, Oracle Substation and alterations to ED 5 substation Davis Dam Proj. Spec. DC 4143, ARIZONA Bureau Reclamation, Dpt. Interior, Phoenix, Ariz. Bids May 27.

▲† **Parker Schram Co.**, Builders Exchange Bldg., Portland, Ore., LB, $1,085,197, Wishram-Ross Section McNary-Ross 345 kv line, 85 miles, Klickitat, Skamania and Clark Counties, WASHINGTON Bonneville Power Admin., 1001 N.E. Lloyd Blvd., Portland, Ore. Bids June 4. CD 5/14.

† **Gibbons & Reed Co.**, Box 2429, Salt Lake City 10, Utah, LB $501,492. est. $649,813, grade U. P. R. R. and Hy. U. S. 30, 5 mi. and 3.6 mi. from Biggs to Rufus, Wasco and Sherman Counties, The Dalles Dam Proj Serial 35-026-54-141. OREGON. U. S. Eng., Pittock Block, Portland, Ore. Bids June 2. CD 5/10.

† **American Elin Corp.**, 1 Wall St., New York 5, N. Y. LB $137,120, four 8-720-10,900 kva, class OA-FA, single-phase transformers, The Dalles Dam Powerhouse, Wasco Co. Oiveng 35-026-54-126. OREGON. U. S. Eng., Pittock Block, Portland, Ore. Bids June 3. CD 4/14.

James & Yost, Inc., 5910 N. E. Ainsworth St., Portland, Ore., LB $80,999, furnish, install, three 20-ton lift gates Bull Run Dam, PORTLAND, ORE. City, City Hall, Portland, Ore. Bids June 3. CD 5/14.

Atlas Constr. Co., 9210 N. E. Halsey St., Portland, Ore. LB $115,050, 375 g.p.d. sewage plant and pumping stations; LB $134,596, 34,000 lin. ft. 6 to 12 in. sewer sys., ROCKAWAY, ORE. City, City Hall, Rockaway, Ore. Bids June 1. CD 5/14.

† **Dimmitt & Taylor**, 128 W. Pomona Ave., Monrovia, Calif., CA, $571,735, Bull Creek Flood Control, LOS ANGELES, CALIF. Soil Conservation Service, 2033 4 St. San Fernando, Calif. Bids May 15. CD 5/5/53.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **C. B. Lauch Constr. Co.**, S. W. of city, Boise, Idaho, CA, $1,114,565, 6 story, steel, rein.-con. BANK AND OFFICE, BOISE, IDAHO First Security Corp., 114 N. 9 St., Boise, Idaho. Bids June 3. CD 6/2.

▲ **The Fluor Corp. Ltd.**, 2500 Atlantic St., Los Angeles, Calif., CA, $2,500,000. design and construct mfg. of high grade gasoline, 8,000 bbls a day. PLANT, REFINERY, SALT LAKE CITY, UTAH. Salt Lake Refining Co. (Standard Oil Co. of California), 164 S. W. Temple St., Salt Lake City, Utah.

Sampson Grain Co., Prosser, Wash., Day Labor, $153,000, GRAIN STORAGE ELEVATOR and BARGE-LOADING TERMINAL, PATTERSON, WASH.

Guth & Schmidt, 2821 S. St. Sacramento, Calif., LB, $322,686, multi-purpose bldg. for Elk Grove High SCHOOL, ELK GROVE, CALIF. Elk Grove Union High School, Elk Grove, Calif. Gordon Stafford, 1024½ J St., Sacramento, Calif., archt.

▲ **Groom-Moyers Co.**, Hayward, Calif., Owner Builds $6,500,000. 650-HOME subdivision, to be known as Fairmede, RICHMOND, CALIF.

▲ **Bollenbacher & Kelton**, 4802 Twain St., San Diego, Calif., Owner Builds, $1,500,000, 154 frame, stucco DWELLINGS In Allied Gardens Tract, SAN DIEGO, CALIF.

▲ **McKeon Constr. Co.**, 550 Taraval St., San Francisco, Calif. Owner Builds. $10,000,000. 864-HOME subdivision, SOUTH SAN FRANCISCO, CALIF.

▲ **Del E. Webb Constr. Co.**, Box 4066. Phoenix, Ariz., LB, $5,988,000, construct, manage, finance Military HOUSING, TWENTYNINE PALMS, CALIF. Dpt.. Navy, Eleventh Naval District, San Diego, Calif. Bids June 2. CD 5/21.

The pioneer still leads

in 6-wheel sales for 18th straight year!

New INTERNATIONAL RF-190 Series. Proved INTERNATIONAL bogie with third differential. GVW ratings, 30,000 to 38,000 lbs. 145, 157, 175, 193, and 211-inch wheelbases. Gasoline, LPG, or diesel power.

Eighteen years ago, the first 6-wheel INTERNATIONALS were built. With them, heavy-industry and off-highway truck operators could haul bigger payloads.

Every year since, INTERNATIONAL has been sales leader in the 6-wheel field. This leadership was won, *and still holds* because of respected INTERNATIONAL quality. Another important reason: owners' records prove INTERNATIONAL 6-wheel trucks keep operating and maintenance costs at a minimum.

You can choose the truck that's *exactly* right for your operation—because INTERNATIONAL builds America's most complete 6-wheel line.

Talk to your INTERNATIONAL Dealer about the right 6-wheel truck to cut *your* operating costs. Time payments arranged.

AMERICA'S MOST COMPLETE 6-WHEEL LINE —23 MODELS

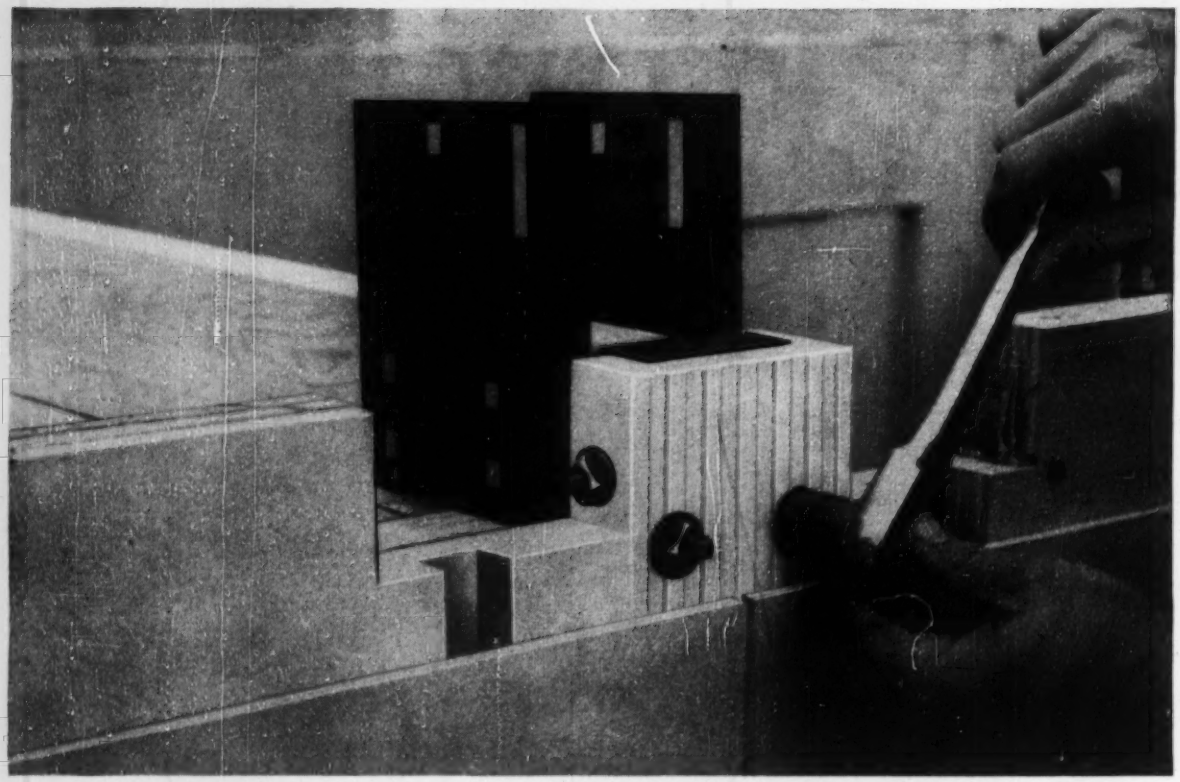
GVW ratings, 22,000 to 90,000 lbs. Engines from 130 to 356 hp. Choice of gasoline or LPG power. Diesel engines available in models with GVW ratings of 30,000 lbs. and over. Transmissions and axle ratios to meet any requirements. America's most complete truck line—170 basic models, from ½-ton pickups to 90,000 lbs. GVW off-highway models.

INTERNATIONAL HARVESTER COMPANY • CHICAGO

International Harvester Builds **McCORMICK**® Farm Equipment and **FARMALL**® Tractors . . . Motor Trucks . . . Industrial Power . . . Refrigerators and Freezers

Better roads mean a better America

INTERNATIONAL® TRUCKS
"Standard of the Highway"



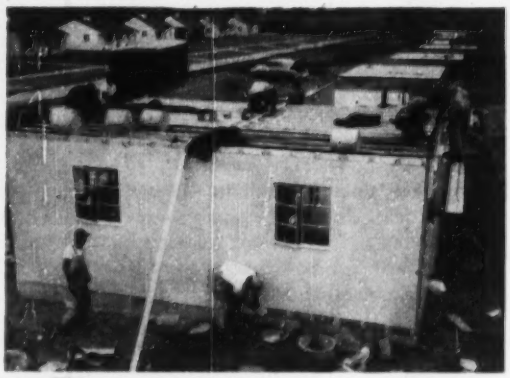
RAISING THE ROOF of a U.S. Steel home goes faster with help of RB&W bolts. Here workman is tightening bolt holding steel plate to exterior wall panel. Plate is then used as joint for bolting ceiling panels.

That's a house he's bolting together!

U.S. Steel Homes found that bolting together the panels of their fast-selling homes saves time and trouble. Nails are used only to hold panels temporarily in position for bolting and add no structural strength.

It's no accident, of course, that RB&W bolts and nuts were specified here. U.S. Steel Homes isn't the first to discover that the absolute uniformity and dependable holding power of RB&W products make them the best fasteners for any job. Workmen like the way RB&W nuts run on RB&W bolts fast and easy. And there's no question about the extra strength RB&W bolt-and-nut construction gives these homes.

Whenever you want to put something together *fast*, and make it stay fastened *for good*, give one of our men a ring. As a top-ranking maker of all kinds of fasteners, we're always able to recommend and supply the right ones for all your needs. You can count on fast delivery, too. RUSSELL, BURDSALL & WARD BOLT AND NUT COMPANY, Port Chester, N.Y.



HOUSE GOING UP. U.S. Steel home nears completion as workmen on scaffold (right) bolt on exterior panels. These sturdy homes offer quality construction at budget price.

3.8

RB&W

109 YEARS MAKING STRONG THE THINGS THAT MAKE AMERICA STRONG

Plants at: **PORT CHESTER, N.Y.; CORAOPOLIS, PA.; ROCK FALLS, ILL.; LOS ANGELES, CALIF.** ***Additional sales offices at:*** **ARDMORE (PHILA.), PA.; PITTSBURGH; DETROIT; CHICAGO; DALLAS; SAN FRANCISCO.** ***Sales agents at:*** **PORTLAND, SEATTLE.** ***Distributors from coast to coast.***

CANADA

BIDS ASKED—BUILDINGS

▲ **Ont., Hamilton**—BANK, OFFICE—BA 6/21—Royal Bank of Canada, 360 St. James St. W., Montreal, Que., bank and office at 28 James St. S., $2,000,000. N. Wagner, 42 James St. N., Hamilton, engr. E. P. Warren, c/o owner, archt. CD 12/29/53.

▲ **Ont., Toronto**—WAREHOUSE EXTENSION—BA 6/21—Canadian Industries Ltd., Paint and Varnish Div. P. O. Box 10, Montreal, Que., 1 story, 206x277 ft., steel, brick warehouse extension, research and development lab., Castlefield and Snyder Aves. $1,500,000. D. A. Killam, c/o owner, engr. CD 5/24.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

ONTARIO—Ontario Dpt. Mines, Parliament Bldgs., Toronto,

Hearst Constr. Co., Hearst, Ont., CA, $111,375 mining road 13¼ mi. grav. surf., 22 ft. wide in Manitouwad area of northern Ontario into Geo mining development. Awarded May 28. CD 4/27/44.

▲ **F. E. Shaw Ltd.,** 530 South Vidal St., Sarnia, Ont., LB $1,500,000, pipeline for International Boundary North of Lewiston Bridge, Niagara River to near Port Credit, ONTARIO, Western Pipe Lines, Nanton Bldg., Winnipeg, Man. Canadian Bechtel Ltd., 44 King St. W., Toronto, engr.

▲ **Federal District Commission,** Govt. of Canada, 290 Carling Ave., Ottawa, Ont., Own Forces, $1,100,000. constr. and development of Gatineau Parkway System, HULL, QUE. CD 11/25/46.

Montpelier Constr. Ltd., 4800 Iberville St., Montreal, Que., CA, $94,077, sewers at St. Helen Island, MONTREAL, QUE. Municipality, City Hall, Montreal, Que. Jean Asselin, City Hall, Montreal, Que., city engr. CD 10/24/44.

▲ **SASKATCHEWAN**—Province of Sask., Regina, Sask.

Henderson Brothers & Burton, Vanguard, Sask., CA, $167,000, grading from Aikins to Fauna Siding 11.69 mi. Bids May 12, CD 5/6;

W. E. Clark, Mortlach, Sask., CA, $86,000, grading 3.65 mi. from Swift Current to Aikens Overpass, Bids Apr. 30, CD 4/21;

Everitt Metcalf, 15 Dufferin Ave. East., Portage La Prairie Man., CA, grading 12.88 mi. Kincorth to Alberta Boundary, Bids Apr. 28, CD 4/21;

Beattie Ramsay Constr. Co., P. O. Box 86, Regina, Sask., CA, $930,000, constr. 32.08 mi. road Tompkins to east of Webb, Bids May 7, CA, $157,000 grading Macoun to Northwest of Hitchcock;

General Gravel Co. Ltd., 105 Canada Bldg., Saskatoon, Sask., CA, $170,000, constr. 20.83 mi. road Ens Corner to Bremen Corner;

Continental Constr. Co., P. O. Box 129, Regina, Sask., CA, $94,000, grading 15 mi. Highgate to Bresaylor;

Ferguson Constr. Co., 1128 Main St., North Battleford, Sask., CA, $63,000, grading 8.3 mi. Radisson to Fielding;

Acorn Constr. Ltd., Fenton, Sask., CA, $208,000, grading 11.72 mi. Kincorth to Junction of Highway 21. CD 10/1/43. Grand total, $1,875,000.

BUILDINGS

LOW BIDS AND CONTRACTS

Poole Construction Co. Ltd., Calgary, Alta., CA, $300,000 1 story 120x160 ft., concrete, steel, brick, PLANT, CALGARY, ALTA. Auto-Lite Batteries of Canada Ltd., 1360 Dufferin St., Toronto, Ont. CD 2/26.

Rolf Vollan Ltd., c/o Main & Assocs., archts., 9130 Jasper Ave., Edmonton, Alta., $150,000. WAREHOUSE, CALGARY, ALTA. Dunlop Tire & Rubber Co. 522 11 Ave., Calgary, Alta. CD 12/31/53.

▲ **Carter Construction Co. Ltd.,** 419 Cherry St., Toronto, Ont., CA, $1,729,000, GRAIN ELEVATOR, CHURCHILL, MAN. National Harbor Bd., West Block, Ottawa, Ont. Bids May 26. CD 5/3.

Abbey Landry, College Bridge, N. B., CA, $400,000. 3 story, concrete, steel, stone CHURCH, BUCTOUCHE, N. B. Parish of the St. John the Baptist, Buctouche, N. B. Awarded May 28.

Horwood Lumber Co. Ltd., St. John's Newfoundland, CA, $300,000. 60x250 ft., rein.-con., steel school, ST. JOHN'S, NEWFOUNDLAND, Roman Catholic Episcopal Corp., St. John's, Newfoundland. John E. Hosking, Waterford Bridge Rd., St. John's, Newfoundland, archt. Awarded May 28.

▲ **Montrose Builders Inc.,** 2757 Maplewood Ave., Montreal, Que., Owner Builds, $2,500,000, 24, each 3 story 59x60 ft., concrete, brick stone APARTMENT BLOCKS, MONTREAL, QUE. B. A. Shulman 5174 Cote des Neiges Rd., Montreal, archt.

▲ **E. G. M. Cape & Co.,** 620 Cathcart St., Montreal, Que., CA, $3,000,000. 5 story bsmnt., COLLEGE extension, Stanley and Drummond Sts., MONTREAL, QUE. Bd. of Governors, Corp. of Sir George William, 1441 Drummond St., Montreal, Que. Bids Apr. 6. CD 3/24.

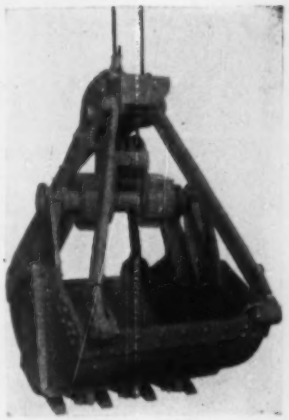
▲ **Owner,** c/o B. A. Shulman, archt., 5174 Cote des Neiges Road, Montreal, Que., Owner Builds, $3,000,000. 350, one story, bsmnt., concrete, brick, stone HOUSING UNITS, MONTREAL SOUTH, QUE.

Bernier & Gagne, 460 Boivin Blvd., Granby, Que., CA, $700,000. 2 story, bsmnt., rein.-con., brick, JUVENAT in St. Anicet Parish, ST. ANICET, QUE. Frs. of Sacre Coeur, Arthabaska, Que. J. M. Lafleur, 17 Nicholas St., Valleyfield, Que., archt.

It All Depends on the BUCKET
AT THE END OF THE LINE . . .

The bucket is usually less than one-tenth of the whole investment in your materials handling equipment. Yet, to get all the pay load you should on every pass depends more on the bucket than on anything else.

To be sure you have the right bucket for the job, let our field engineers look over your set-up. There's no charge, and their recommendations will help you get the most out of a major investment.



Write for BULLETIN 403, Dept. R64

FORMERLY ERIE STEEL CONSTRUCTION COMPANY

ERIE STRAYER CO.

SAME PEOPLE • SAME PRODUCTS • JUST A NEW NAME

264 GEIST ROAD • ERIE, PENNSYLVANIA

free

send for this catalog describing acker's new all-purpose digger

Send the coupon today for your copy of our new catalog showing the wide range of application as well as the many exclusive features that make the *Acker All-Purpose Digger* the most versatile and useful you can buy!

TWO MODELS TO CHOOSE FROM — Jeep mounting with compact, power take-off or skid-mounted with self contained power plant for truck mounting.

ACKER DRILL CO., Inc.
725 W. Lackawanna Avenue, Scranton, Penna.

Please send me free copy of Bulletin 40-ENR.

Name_____ Title_____

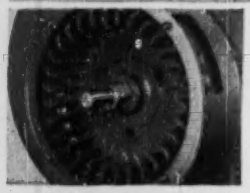
Firm_____

Street_____

City_____ State_____

WISCONSIN HEAVY-DUTY Air-Cooled ENGINE

Performance Features



TROUBLE-FREE, ALL WEATHER AIR-COOLING . . .

No machine is any better than the Power that drives it. And efficient cooling, under all operating conditions, is one of the first essentials to dependable power! A large capacity fan, cast in the flywheel of every Wisconsin Engine, provides trouble-free cooling, even in the most extreme temperatures.

TAPERED ROLLER BEARINGS AT *BOTH ENDS* OF CRANKSHAFT . . .

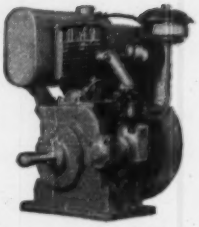
These self-cleaning, file-hard bearings take up all load thrusts, permitting the use of either chain-, belt- or gear-drive direct from the extended crankshaft, without fear of damaging main or connecting rod bearings. This does away with the need for an outboard bearing.

HIGH TENSION, ROTARY TYPE OUTSIDE MAGNETO . . .

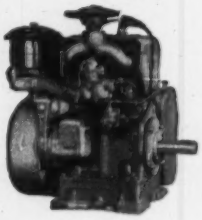
Positive gear drive direct from camshaft assures steady, uniform ignition at all times. The complete unit is conveniently mounted on the OUTSIDE of the engine for easy accessibility. Weather-sealed against moisture and dust. Equipped with Impulse Coupling for quicker, easier starting at all seasons.

POSITIVE, PUMP-CIRCULATED LUBRICATION . . .

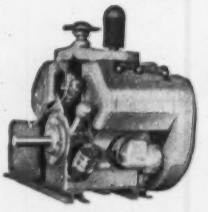
All single cylinder models (with exception of Model AEN) have pump-circulated level splash system. Model AEN and multi-cylinder models pump an individual oil stream to each connecting rod. Other parts are lubricated by oil spray, assuring complete and thorough lubrication for smooth-running and long engine life.



● Single Cylinder 6 to 9 hp.



● 2-cylinder 7 to 15 hp.



● 4-cylinder V-type 15 to 36 hp.

● These are some of the reasons why it pays to specify "WISCONSIN AIR-COOLED ENGINES" as standard Power Components.

WISCONSIN MOTOR CORPORATION

World's Largest Builders of Heavy-Duty Air-Cooled Engines

MILWAUKEE 46, WISCONSIN

GUNITE Since 1915

CONCRETE SAND AND CEMENT "Placed by Air"

We have a well trained and experienced field organization. We own and operate 43 complete cement gun outfits.

Send for specifications and bulletins No obligation

See our catalog in Sweets

GUNITE CONCRETE & CONST. CO.

1301 WOODSWETHER RD. KANSAS CITY 5, MO.
2016 W. WALNUT, CHICAGO 12, ILL.
2036 ADDISON, HOUSTON 25, TEXAS
St. Louis—Minneapolis—Denver—New Orleans

PILES

CAST-IN-PLACE
SECTIONAL PIPE
COMPOSITE
STEEL H-PILE
TIMBER

DRIVEN FOR EVERY CONDITION
FOR EVERY STRUCTURE

MacArthur Concrete Pile Corp.

18 East 48th Street, New York 17, N. Y.
New Orleans Cincinnati Pittsburgh
PILE DRIVING CONTRACTORS SINCE 1910

ALASKA

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲† L. E. Baldwin, Inc., 1103 N. 36 St., Seattle 3, Wash., CA, $2,403,338, est. $2,381,632, two 80 x 200 ft. rein-con. warehouses, ENG-95-507-54-61;

Lytle & Green and S. Birch & Sons, Securities Bldg., Seattle 1, Wash., CA, $643,886, est. $1,053,000. steam tie lines, manholes and electrical service to manholes, ENG-95-507-54-95, Elmendorf Air Force Base, ALASKA. U. S. Eng., Anchorage, Bids May 28. CD 6/3, under LB.

AMERICANS ABROAD

BUILDINGS

LOW BIDS AND CONTRACTS

▲ Fluor Corp. Ltd., M. Esperson Bldg., Houston, Tex. CA, $5,750,000. design and construct, thermofor catalytic REFINERY CRACKING UNIT, TAIWAN, FORMOSA. Chinese Petroleum Corp., Taiwan, Formosa.

Proposed Projects

WATER SUPPLY

Ark., Corning—City, Mayor Frank Johnson, water treatment plant, water distr. sys., sewage treatment plant, sewage collection sys., $330,000. Max Mehlberger, Pyramid Life Bldg., Little Rock, consult. engr.

O., Eastlake—City, Eastlake, c/o Cleveland P.O., $200,000 municipal bond issue voted Nov. 4, has been cancelled as it was improperly advertised, water mains. CD 11/9.

Tex., Bacliff—Bayview-Galveston Co. Water Control & Imprvt. Dist. 13, C. D. Polse, dist. pres. Court House, Galveston, water supply wells, $70,000; c.i. water lines, $34,000; WW rehabilitation, $36,000. F. J. Metyko, Stewart Bldg., Houston, consult. engr. CD 10/2.

Tex., Pasadena—City, Clyde T. Gary, mayor, bond election June 8: water elevated storage, $75,000; c.i. water lines, $225,000; WW sys. rehabilitation, $41,500. CD 5/19.

Tex., San Antonio—City Water Bd., 106 W. Market St., erect 80 mg. steel ground water storage tank back of Market St. Plant. $680,000.

Que., Dorval—Municipality, City Hall, water supply imprvs., incl. filtration plant. $500,000. S. Tremblay, 18 Murray Gardens, Pointe Claire, engr. CD 1/5.

Que., St. Georges de Champlain—Municipality, WW system, $100,000.

SEWERS, WASTE DISPOSAL

▲ Mich., Carrollton—Carrollton Twp., sewerage sys., sewage plant, treatment facilities 2½ mi. force mains, 5 sewer lift stations, 200 mi. sanitary sewers, $1,000,000. Francis Eng. Co., 201 Eddy Bldg., Saginaw, consult. engr.

Mich., East Lansing—Meridian Twp., C. B. Robinson, clk., 2116 Haslett Rd., interceptor sewer, pumping station, sanitary sewers, Meridian. $200,000. Frank Theroux, 2116 Haslett Rd., East Lansing, consult. engr. CD 4/14.

O., Chagrin Falls (Cleveland P. O.)—Village, Village Hall, Chagrin Falls, Cleveland P. O., bond election Nov. 12, active sludge treatment plant, proprietary type, Solon Rd. near Maple St. $200,000. R. F. MacDowell & Assocs., Chester-12th Bldg., Cleveland, Zone 14, consult. engrs. C. W. Courtney Eng. Co., The Arcade, Cleveland, Zone 14, owner, engr. CD 1/18.

O., Hamilton—City, City Hall, storm sewers in south side of Hamilton, $500,000. Gordon Russell Neal & Assoc., Taft Rd., Cincinnati, consult. engrs. Fred Herdy, city engr. CD 6/1/49.

Ore., Eugene—City, City Hall, voted bonds sewage projects. $875,000. W. C. Clubb, city engr. CD 3/17.

Tex., Bacliff—Bayview-Galveston Co. Water Control & Imprvt. Dist. 13, Court House, sewage disposal plant unit, $60,000; storm sewers, $65,000. F. J. Metyko, Stewart Bldg., Houston, consult. engr. CD 10/2.

Tex., Houston—Frank W. Sharp, 2202 Rosslyn St., sanitary sewers, $69,000; storm sewers, $65,000, exten. of Scenic Woods.

Tex., Houston—Frank Sharp, 3201 Oak Grove St., sanitary sewers, $67,500; storm sewers, $63,500, Second Sect. development north of Halls Bayou.

Tex., Spring Branch—J. E. Lyon Building & Development Co., Prudential Bldg., Houston, storm sewers, $60,000; sanitary sewer collection lines, $62,500, in Second 40-acre tract off Campbell and Neuens Rds.

Ont., Sudbury—City, City Hall, storm sewers to serve 10 streets in northeastern section of city. $300,000. T. L. Hennessy, c/o owner, engr. CD 4/24/52.

BRIDGES

▲ Ill., Decatur—City, City Hall, (1) subway on Grand Ave. and (2) overpass on Garfield Ave. $1,000,000. Balke & Clarke, Urbana, consult. engrs.

Buildings are more than just steel, bricks and air conditioning. A big part of total cost is in site preparation, excavation, foundations, parking lots and other non-building work. Also needed are access roads, railroads, waste disposal, water supply, power.

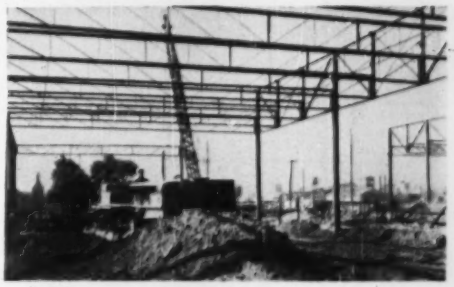
Needed: 11,600,000,000 more square feet of floor space

AMERICAN BUSINESS FIRMS have spent more than $49 billion to construct new facilities since 1946. But, to keep up with our economy, another $150 billion will have to be spent by 1975. We will need 7.4 billion square feet of factory floor space and 4.2 billion square feet of commercial space in hotels, stores, warehouses, offices, etc.

Expanding business which demands $6 to $8 billion a year in new facilities feeds on itself. It both demands and produces a strong economy and a strong construction industry.

The men who will guide, produce and pay for this work must have wide-angle vision. With the normally complex task of planning, erecting and equipping a building, they must integrate construction of all utilities necessary to operate it – sanitary and water supplies, power, transportation facilities, etc. On top of their technical skills, they must know labor relations, costs, pricing, logistics, financing and other non-technical subjects.

Engineering News-Record, with its wide-angle reporting, is the only publication that keeps them posted on all these subjects as they pertain to building and construction. That's why, as these billions are spent on a greater America, you'll find your most important customers reading Engineering News-Record.



Manufacturers of building materials and supplies, construction equipment, and installed equipment will need more factories to keep up with this demand – and thus the cycle continues.

In building and construction,

IF YOU'RE IMPORTANT YOU EITHER READ

ENGINEERING NEWS-RECORD

OR YOU ADVERTISE IN IT, OR BOTH

A McGraw-Hill Publication
330 West 42nd St., New York 36, N. Y.
Member — ABC — ABP

McKIERNAN TERRY

Speedy Pile Driving and Pile Pulling

On the new Housatonic Bridge connecting Derby and Shelton, Conn., four pieces of McKiernan-Terry equipment were teamed up by the contractor, Mariani Construction Co., for fast pile driving and extracting.

McKiernan-Terry 9B3 and 10B3 Double-Acting Hammers drove 40 to 65-foot steel piles to refusal in rock for four piers and the east abutment.

Cofferdam steel piles, 40 feet in length, were driven by a McKiernan-Terry Double-Acting No. 7 Hammer and quickly removed with a McKiernan-Terry E4 Pile Extractor.

For pile driving versatility, standardize on McKiernan-Terry. Write for bulletin. MK 3118

McKIERNAN-TERRY CORPORATION
MANUFACTURING ENGINEERS
Also Manufacturers of Coal and Ore Unloaders and Bridges, Grab Buckets and Special Machinery
13 PARK ROW, NEW YORK 38, N. Y.

PHOENIX BRIDGE COMPANY
Engineers—Fabricators
Erectors
Structural Steel
BRIDGES and BUILDINGS
General Office and Shops
PHOENIXVILLE, PA.
Subsidiary—Barium Steel Corporation

Diamond Core
Drilling
CORE BORINGS for Foundations, Dams, Bridges and all Heavy Structures
GROUT HOLES
Tinney Drilling Co.
Grafton, W. Va.

† **WASHINGTON**—Bureau of P. Rds., Dpt. Commerce, Morgan Bldg., Portland, Ore.,
Snohomish Co.—bridge and grading 0.6 mi. South Fork Stillaguamish Highway $175,000. F. E. Andrews, acting div. engr.

▲ **Ont., Deseronto**—Hastings Co. and Prince Edward Co., swing bridge and causeway to connect Hasting Co. with Prince Edward Co. $1,000,000.

STREETS AND ROADS

▲† **IDAHO**—Bureau of P. Rds., Dpt. Commerce, 609½ Bannock St., Boise,
Bonner Co.—surf., oiling 9 mi. Kootenai Highway, $230,000;
grading 11.3 mi. Priest River Rd., $250,000;
Bonneville Co.—grading 6 mi. Victor-Irwin Highway, $200,000.
Elmore Co.—surf. 23.8 mi. Sawtooth Park Highway, $300,000.
Fremont Co.—surf., oiling 12 mi. Yellowstone Park Highway, $400,000.
Idaho Co.—grading, oiling 3.7 mi. Warren Wagon Rd, $230,000.
Shoshone Co.—grading 3 mi. Enaville-Murray, $150,000.

▲ **ILLINOIS**—Illinois State Toll Highway Comn., Springfield, preliminary report for Illinois Toll Road includes:
103 mi. North-South Turnpike Chicago to Danville, $105,000,000;
25 mi. Chicago-Milwaukee Turnpike, $33,000,000.
154 mi. Old National Trails Turnpike. $163,000,000.
FOR FUTURE CONSIDERATION:
extension North Illinois Turnpike from east of Rockfort to East Dubuque.
Mid-State Turnpike from No. Ill. Turnpike east of Rockfort to La Salle-Peru.
Chicago-Peoria Turnpike from Joliet via La Salle Peru to Rt. 66 north Springfield.
Intra-State Turnpike from Danville via Springfield to Quincy to Missouri line at Hannibal, Mo.
Inter-City Turnpike from Rock Island to Intra-State Turnpike connections south of Champaign-Urbana.
Extension of North-South Turnpike from Intra State Turnpike connection west of Danville to Cairo.
South Illinois Turnpike from East St. Louis to Brookport on Ohio River. Total cost $583,000,000

Mich., Ferndale—City, Dpt. P. Wks., 21205 Woodward St., 82,560 sq. yd. b. conc. parts of 40 streets, Oakridge, Livernois to Woodward Sts.; east side Livernois, Nine Mile to Winthington Sts.; East Nine Mile, Woodward to Alley Sts.; Hilton, Eight to Nine Mile Rd. $175,000, James Taylor, city engr.

† **MONTANA**—Bureau P. Rds., Dpt. Commerce, Post Office Bldg., Missoula,
Gallatin Co.—8 mi. west Gallatin Hy., $300,000.
Lake Co.—10 mi. Swan River, $340,000.
Lincoln Co.—surf. oiling 2.6 mi. Libby-State Line Hy., $55,000. K. S. Chamberlain, dist. engr.
WASHINGTON—State Hy Comn., Olympia,
Yakima Co.—enlarging Yakima Canyon Tunnel on Ellensburg-Yakima Highway, $300,000. W. A. Bugge, state hy. dir.

▲† **WASHINGTON**—Bureau P. Rds., Dpt. Commerce, Morgan Bldg., Portland, Ore.,
Chelan Co.—surf. and oiling 10.8 mi. Lake Chelan Highway, $200,000;
Jefferson Co.—grading, surf. 5.2 mi. Olympic Highway, $325,000;
King Co.—grading 5 mi. Sunset Highway, $360,000;
Snohomish Co.—surf., oiling 6.9 mi. South Fork Stillaguamish, $150,000;
surf., oiling 6.7 mi. Stevens Pass Highway $280,000.
F. E. Andrews, c/o owner, acting div. engr.

▲ **Ont., Hamilton**—Wentworth Co., Hamilton road imprvts. for 1954, $1,071,000. CD 2/15/51.

AIRPORTS

† **Mass., Falmouth**—HANGAR—U. S. Eng., 857 Commonwealth Ave., Boston, double cantilever hangar Otis Air Force Base. $500,000. Kuljian Corp., 1200 N. Broad St., Phila., Pa., consult. engrs. CD 7/10/52.

▲† **Wash., Moses Lake**—HANGARS, etc.—U. S. Eng., City-County Airport, Walla Walla, multi-purpose wing hangars, over $500,000; armaments electronic shop and organization maintenance shop, over $100,000. Larson Air Force Base. CD 12/28/49.

▲† **Wash., Spokane**—RUNWAY—U. S. Eng., City-County Airport, Walla Walla, extending runway at Fairchild Air Force Base, $5,176,000. CD 10/31/51.

▲ **Ont., Ottawa**—TERMINAL—Dpt. Transport, Ottawa, terminal bldg. at Uplands Airport, $1,000,000. CD 4/20/53.

LATIN AMERICA

▲ **Chile**—CRUDE LINE—Empress Nacional del Petroleo, Concon, Chile, plans 80 mi. 10 in. crude line, Concon to Santiago. $2,100,000.

▲ **Chile, Santiago**—Ministry of P. Wks. & Communications, Santiago, making final plans for subway. Est. $14,000,000. Contractors interested in bidding may register now. CD 5/28/46.

PUBLIC BUILDINGS

Calif., Berkeley—HESSE HALL—University of California, Administration Bldg., plans by Russell Guerne de Lappe & Mitchell Van Bourg, Claremont Hotel, Hesse Hall Laboratory addn. $600,000. CD 9/24/57.

Gurley current meters now available in fresh or salt water models

Gurley, maker of fine current meters for federal, state and municipal bureaus for 70 years, now supplies its Price Pattern Current Meter in either fresh or salt water models. Gurley's Price Pattern instruments, designed by W. G. Price of the U. S. Geological Survey, are in use around the world.

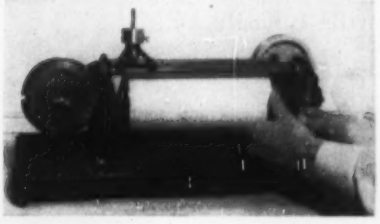
The Gurley Current Meters are available in a variety of outfits for use by overhead-cable suspension...wading-rod suspension...exploration and survey parties. Gurley also makes the Pygmy for shallow streams, flumes and canals.

The salt water model incorporates a commutator which indicates each tenth revolution of the bucket wheel. Sealed commutator box excludes salt water, a conductor of electricity, from the contact chamber. *Write for Bulletin 700.* This illustrated 16-page booklet gives full details on all Gurley Current Meter outfits.

Gurley Water Level Recorders make continuous graphic record for entire day or week.

The float-operated Gurley Graphic Water Level Recorder, simple in construction and operation, is widely used in reservoirs, sewers, sewage disposal and hydro-electric plants, and supplements irrigation and stream gaging measurements.

Made of non-corrosive materials, Gurley Recorders make a *continuous* graphic record. A rectangular chart is used. Available in natural scale models or others adaptable from 1 to 40 feet. *Write for details.*



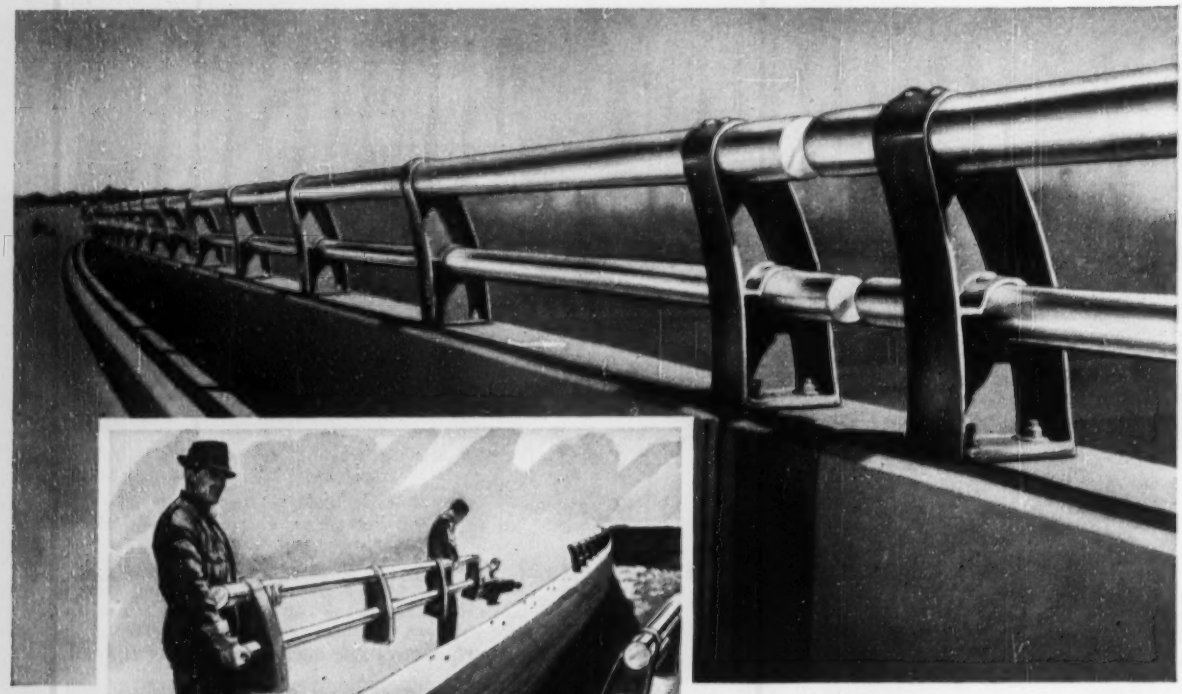
GURLEY

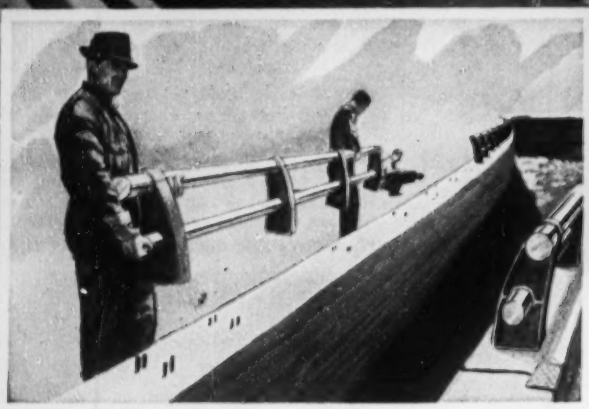
W. & L. E. GURLEY HYDRAULIC INSTRUMENTS DIVISION
TROY, N. Y.

Gurley—Since 1845

3-MILE PROOF OF ALUMINUM'S ADVANTAGES

...RUSTPROOF, LOW COST, LOWEST MAINTENANCE





Light weight! Two men could easily move the completed railing sections into position.

Reynolds Aluminum Guard Rails on Southwest Trafficway, Kansas City, Mo.

Fabricators: Southwest Ornamental Iron Co., and T. & W. Foundry, Kansas City.

Engineers: Howard, Tammen, Needles & Bergendorff, Kansas City.

The three miles of extruded pipe and the sand cast posts of this installation are all Reynolds Aluminum. Primary reasons for its choice were freedom from rust and resistance to corrosion—no painting, no stains on parapet and sides. Light weight, ease of installation and design flexibility were further advantages. Net result was declared to be "functional superiority and attractive appearance at low cost."

Here is a good example of a standard Reynolds Aluminum mill product—extruded pipe—adapted to a particular design need. For other requirements, and for names of metal fabricators who can perform aluminum work to your specifications, call the nearest Reynolds Office listed under "Aluminum" in classified directories. Or write to **Reynolds Metals Company,** General Sales Office, Louisville 1, Kentucky.

For quick reference, see catalog $\frac{5a}{Re}$ *in Sweet's Architectural File.*

REYNOLDS ALUMINUM

SEE "MISTER PEEPERS," starring Wally Cox, Sundays, NBC-TV Network.

Calif., **Brea**—SCHOOL—Brea School District, Brea, voted $750,000 bonds, school construction. CD 5/17.

Calif., **Broderick**—SCHOOL—Washington Elementary School Dist., P. O. Box 318, West Sacramento, plans by Barevetto & Thomas, 718 Alhambra Blvd., Sacramento, Washington Elementary School $350,000.

Calif., **Davis**—RESIDENCE HOUSE—University of California, Administration Bldg., Berkeley, plans by Herbert E. Goodpastor, 1812 J St., Sacramento Women's Residence House on Davis Campus, $650,000. CD 8/24/44.

Calif., **Fullerton**—SCHOOL—Fullerton Elementary School District, Fullerton, voted $750,000 bonds, school construction. CD 3/23.

Calif. **Los Altos**—SCHOOL—Los Altos Elementary School District, Box 188, plans by Lawrence Gentry, 144 State St., Springer School $350,000. CD 4/6

Calif., **Milpitas**—SCHOOL—Milpitas Elementary School Dist., P. O. Box 92, Milpitas, plans by Russell Guerne de Lappe & Mitchell Van Bourg, Claremont Hotel, Berkeley, new elementary school, $300,000. CD 1/7.

Calif., **Modesto**—OFFICE—Modesto Irrigation District, 823 11 St., plans by Russell Guerne de Lappe & Mitchell Van Bourg, Claremont Hotel, Berkeley, office bldg. $550,000.

Calif., **Pleasanton**—SCHOOL—Pleasanton Elementary School Dist., P. O. Box 367, plans by Russell Guerne, de Lappe, & Mitchell Van Bourg, Claremont Hotel, Berkeley, Santa P ta Elementary School. $360,000.

▲ Calif., **Richmond**—SCHOOL—Richmond Union High School, 1108 Bissell Ave., plans by Donald Hardison & Assocs., 225 Broadway, E. M. Downer Junior High School. $1,600,000. CD 3/26/52.

▲ Calif., **San Francisco**—SCHOOL—City and San Francisco Co., Dpt. P. Wks., City Hall, plans by Gardner A. Dailey, 442 Post St., Luther Burbank Junior High School. $2,700,000. CD 11/17/48.

Calif., **San Luis Obispo**—HOSPITAL—San Luis Obispo Co., Court House, plans by Wm. D. Holdredge, Box 421, wing addn. to county hospital. $450,000.

Calif., **Visalia**—SCHOOL—Visalia City Elementary School District, 815 S. Conyer St., defeated $980,000 bonds, new school construction. CD 4/6.

Calif., **West Esparto**—SCHOOL—Esparto Union Elementary School District, Esparto, plans by Barevetro & Thomas, 718 Alhambra Blvd., Sacramento, Calif., elementary school $300,000.

▲ Colo., **Adams City**—HOUSING, etc.—Phillip Shaiman Glenwood Springs, 300-unit housing, $2,000,000; shopping center, $1,000,00.

Conn., **Bethel**—SCHOOL—Town, Supt. Schools, 10 Durant Ave., school, Judd Ave. $600,000.

Conn., **Fairfield**—SCHOOL—Town School Bldg. Comm., Town Hall, plans by Lyons & Mather, 211 State St., Bridgeport, elementary school, Mill Hill Rd. $350,000. CD 7/20.

▲ Ga., **Calhoun**—SCHOOLS—Gordon Co. Bd. Educ., Calhoun, plans by Bothwell & Nash, Marietta, and Glass-Montgomery-Turner, Rome, schools. $1,120,950.

▲ Ill., **Ottawa**—SCHOOL—City and La Salle Co., Ottawa, voted $1,400,000 bonds, new central grade school.

Ind., **Plainfield**—SCHOOL—Bd. School Trustees, Plainfield, plans by Everett I. Brown, Circle Tower Indianapolis, Zone 4, 2 story, bsmnt., brick, stone, rein-con., structural steel, high school addn. and remodeling. $400,000

Mass., **Falmouth**—ARMORY—State, Military Dpt., 905 Commonwealth Ave., Boston, armory (1 unit). $144,000.

Mass., **Lexington**—SCHOOL—Town, 1475 Massachusetts Ave., plans by Kilham, Hopkins, Greeley & Brodie, 9 Arlington St., Boston, masonry Franklin School addn., alterations, $300,000. CD 4/2/51.

Mass., **Newburyport**—ARMORY—State, Military Dpt., 905 Commonwealth Ave., Boston, armory (1 unit), $144,000.

Mass., **Westminster** — SCHOOL — Town, Bd. Selectmen, Town Hall, plans by Baker & Dingman, 42 Main St., Leominster, elementary school addn. $300,000.

Mich., **Big Rapids**—SCHOOL—City, George Granger, mgr., voted $660,000 bonds, school. W. B. MacWhirter & Assoc., 1017 Cottage Grove St., archts. CD 6/4.

▲ Mich., **Detroit**—SCHOOL—City, Bd. Educ., 1354 Broadway, 1 story, brick, steel school for handicapped children, Hoover and Seven Mile Rd. East, $1,200,000.

Mich., **Flat Rock**—SCHOOL—Bd. Educ., Flat Rock School Dist., plans by Jensen & Keough, 15875 James Couzens Hy., Detroit, Zone 38, brick, steel. James Barnes Elementary School. $360,000. CD 2/11.

▲ Mich., **Holland**—HOSPITAL—City, brick, steel Holland Hospital addn. $1,100,000.

Mich., **Sault Ste Marie**—CITY COUNTY—City of Sault Ste. Marie and Chippewa Co., plans by Harry W. Gjelsteen, 113 Sixth Ave., Menominee, 2 story, 127x 184 ft., steel, stone city-county bldg. $700,000. CD 2/11.

Mich., **South Lyon**—SCHOOL—South Lyon Twp. Bd. Educ., voted $520,000 bonds high school, elementary school addn., Walter T. Anicka, 617 S. Forest St., Ann Arbor, archt. CD 4/28.

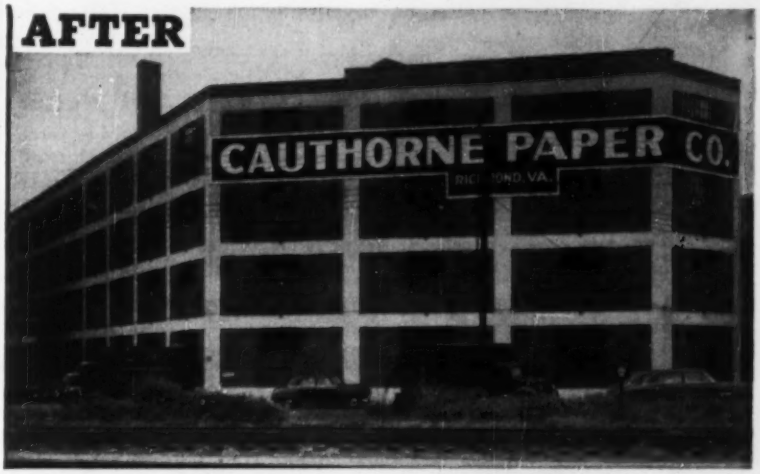
Mo., **Gower**—SCHOOL—Bd. Educ., Gower, plans by J. W. Radotinsky, 1401 Fairfax Trafficway, Kansas City, Kan., elementary and high school, $300,000.

Neb., **Paxton**—SCHOOL—Bd. Educ., Paxton, voted $425,000 bonds May 4, **Paxton-Sarben School**. CD 5/12.

▲ N. J., **Fairlawn**—SCHOOLS—Town, voted $1,525,000 bonds for Junior High School and $685,000 bonds for elementary school.

THORITE *patching mortar and two* THOROSEAL *applications rejuvenated this Virginia building*

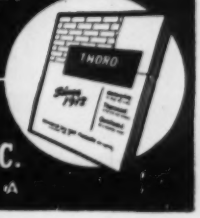
Constant weather exposure over the years caused the masonry of this building to disintegrate. If this unsightly condition had not been corrected it would have finally imperiled the structure of the building.



All concrete spandrel beams, columns, window heads and brick sills were patched and brought flush with surrounding surface by the use of The THORO System product, THORITE, a twenty-minute set, nonshrink, patching mortar. Two brush coats of THOROSEAL were then applied over entire reinforced concrete surfaces, to prevent further disintegration, also to beautify building.

CONTRACTOR: **Southern Waterproofing and Concrete Company, Inc., 1704 Arlington Road, Richmond, Virginia.**

Get our pictorially-described literature, "HOW TO DO IT" and specification guide.

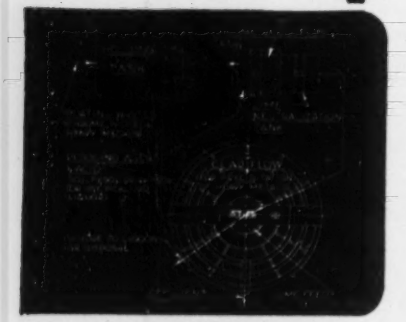


STANDARD DRY WALL PRODUCTS INC.
NEW EAGLE, PENNSYLVANIA

MONROE, MICHIGAN - INDUSTRIAL INSTALLATION

Clariflow

Plating Waste Treatment Continuous Flow Package Unit



Removal of Toxic Metals

Clariflow provides for chrome reduction, precipitation of hydrous oxides of chromium, nickel, copper, zinc, lead and iron; sludge separation; sludge thickening and disposal.

Alkaline and Acid Wastes

These wastes may be treated by batch or continuous process. Batch treatment requires only the addition of chemicals and mixing equipment.

Clariflow is engineered in circular, square or rectangular shapes for new installations or to modernize existing equipment.

write for complete information

WALKER PROCESS

WALKER PROCESS EQUIPMENT INC.

FACTORY • ENGINEERING OFFICES • LABORATORIES

AURORA, ILLINOIS

High Grade Hardwood

SURVEYOR STAKES

Stained Yellow Bound with Steel Strapping

		Per 100	In 1000 Lots Per 100
2x2	12"	$ 7.85	$ 7.15
	15"	9.85	8.95
	18"	11.50	10.50
	24"	16.00	14.50
	36"	24.00	22.50
1x2	12"	6.15	5.60
	15"	6.60	6.00
	18"	7.50	6.50
	24"	10.00	9.00
	36"	14.00	12.00

Prices net F.O.B. Cumberland, Md.

BUCHANAN LUMBER CO.

CUMBERLAND, MD.

UMECO QUALITY INSTRUMENTS

GUARANTEED ACCURACY

Standard American Specifications

Manufactured for UMECO in Japan

Engineer's Transit—26X

5¾" Horizontal circle Coated Lenses

$375.00

complete with collapsible tripod and carrying case

Only UMECO offers so high a Quality at so low a price.

Write for Descriptive Literature

UNION MERCANTILE CO.

465 California Street San Francisco, Calif.

▲ **N. J., Princeton**—SCHOOL—Princeton, Boro Hall, bond election May 18 postponed until Fall, for high school addns. $1,770,000. CD 5/14.

N. M., Jal—SCHOOL—Jal Independent School Dist., Jal, plans by George Graves, Hobbs, N. M., 1 story, 250x250 ft. brick, concrete 24-classroom elementary school, $400,000. Lafayette McKay, Sanford Bldg., Lubbock, Tex., consult. engr.

▲ **N. Y., Roosevelt**—HIGH SCHOOL—Roosevelt Public School Bd., Washington Ave. School, Roosevelt, Junior High School with primary school wing, Denton Pl. and Wagner Ave., $1,900,000; addn. to Centennial Ave. School, $400,000.

O., Bowling Green—HEADQUARTERS—State Dpt. P. Wks., State Dpts. Bldg., Columbus, plans by Barber, Evans & Assoc., Inc., 222½ Huron St., Toledo, T-shaped, 2 story engineering headquarters bldg. for Div. 2, Ohio Hy. Dpt. $350,000. CD 5/26.

▲ **O., Oxford**—SCHOOL—Oxford-Hanover School Dist., Oxford, plans by Potter, Tyler, Martin & Roth, 128 E. 6 St., Cincinnati, 2 story, brick school addn. $1,100,000. CD 5/12.

O., Youngstown—JAIL—Comrs. Mahoning Co., Court House, bond election Nov. 2, county jail. $900,000. Arsene Rousseau, Mahoning Bank Bldg., archt. CD 7/5/50.

▲ **Ore., Medford**—SCHOOLS—Jackson School Dist. 49, Medford, plans by Howard R. Perrin, Klamath Falls, elementary school, $350,000; plans by Robert J. Keeney, 32 N. Central St., high school, $860,000. CD 11/17.

Ore., Pendleton—COURT HOUSE—Umatilla Co., Court House, Pendleton, voted bonds May 21, court house, $742,800. Roald, Schmeer & Harrington, Portland Trust Bldg., Portland, archts. CD 2/4.

Pa., Greensburg—SCHOOL—Hempfield Area Joint School Dist., Greensburg, plans by Hunter, Caldwell & Campbell, U. S. Bank Bldg., Johnstown, 1 story, 307x115x 199 ft. brick, block, steel, Fort Allen Grade School, Hempfield Twp. $375,000.

S. C., Spartanburg—SCHOOL—School Dist. No. 7, Spartanburg, plans by Hudson & Chapman, Spartanburg, Hillcrest-Drayton Elementary School, $425,000.

Tex., Haskell—SCHOOL—Haskell Independent School Dist., Haskell, voted bonds May 15, school. $350,000. CD 5/26.

▲ **Tex., San Angelo**—SCHOOLS—San Angelo Independent School Dist., San Angelo, voted bonds May 22, high school, $2,090,000; No. 1 Elementary School, $650,000; No. 2 Elementary School, $625,000; 35-school classrooms proj. $510,000; cafetorium proj. $325,000; library, $300,000. CD 5/26.

Tex., Slaton—HIGH SCHOOL—Slaton Independent School Dist., P. L. Vardy, supt., Slaton, high school, $300,000.

Tex., Terrell—HOSPITAL—Bd. for Texas State Hospitals & Special Schools, 45 and Lamar Sts., Austin, plans by Tatum & Quade, 2812 Fairmount Sts., Dallas, 4 story, 50,500 sq. ft. bamnt., brick Intensive Treatment Bldg., for 150-patients at Terrell State Hospital. $850,000. Walter C. Moore, c/o owner, superv. archt.

Va., Arlington—SCHOOL—Arlington Co. Bd. Educ., 1426 Quincey St., plans by Allen J. Dickey, 704 N. Glebe Rd., Ashland Elementary School. $719,000. CD 11/25/52.

▲ **W. Va., Morgantown**—MEDICAL SCHOOL—Bd. Governors, West Virginia University, Morgantown, plans by C. E. Silling & Assocs., Masonic Temple, Charleston 5 story, 200x250 ft., teaching unit and 900-bed hospital unit, glass, aluminum, brick. Medical School, $25,000,000.

Wis., Ashland—ARMORY—National Guard, Ashland, armory. $140,000.

Wis., La Crosse—SCHOOL—Bd. Educ., La Crosse Emerson Grade School $300,000; Franklin School $350,000.

Wis., Monroe—SCHOOL—Bd. Educ., Monroe, plans by Weiler & Strang, engrs. and archts. 114 N. Carroll St., Madison, Senior High School addn. $475,000.

▲ **Wis., Racine**—SCHOOL—Bd. Educ., Racine, plans by Warren Holmes Co., Olds Tower Bldg., Lansing, Mich., McKinley and Mitchell Grade Schools addns. $1,000,000. CD 8/27/52.

▲ **Alta., Calgary**—NURSES HOME, etc.—Calgary General Hospital Bd., Calgary, plans by Stevenson & Dewar, 340 7 Ave., 10 story nurses home and school. $1,600,000. CD 9/16.

Man., Portage La Prairie—COLLEGIATE—Collegiate Bd., Portage La Prairie, reconstr. 16-room collegiate, $350,000.

Ont., London—MESS, etc.—Defence Constr. Ltd., 56 Lyon St., Ottawa, reig.-con., 500-men mess bldg., rein.-con. chapel, guardhouse and garage, at Wolseley Barracks, $850,000. CD 3/18/53.

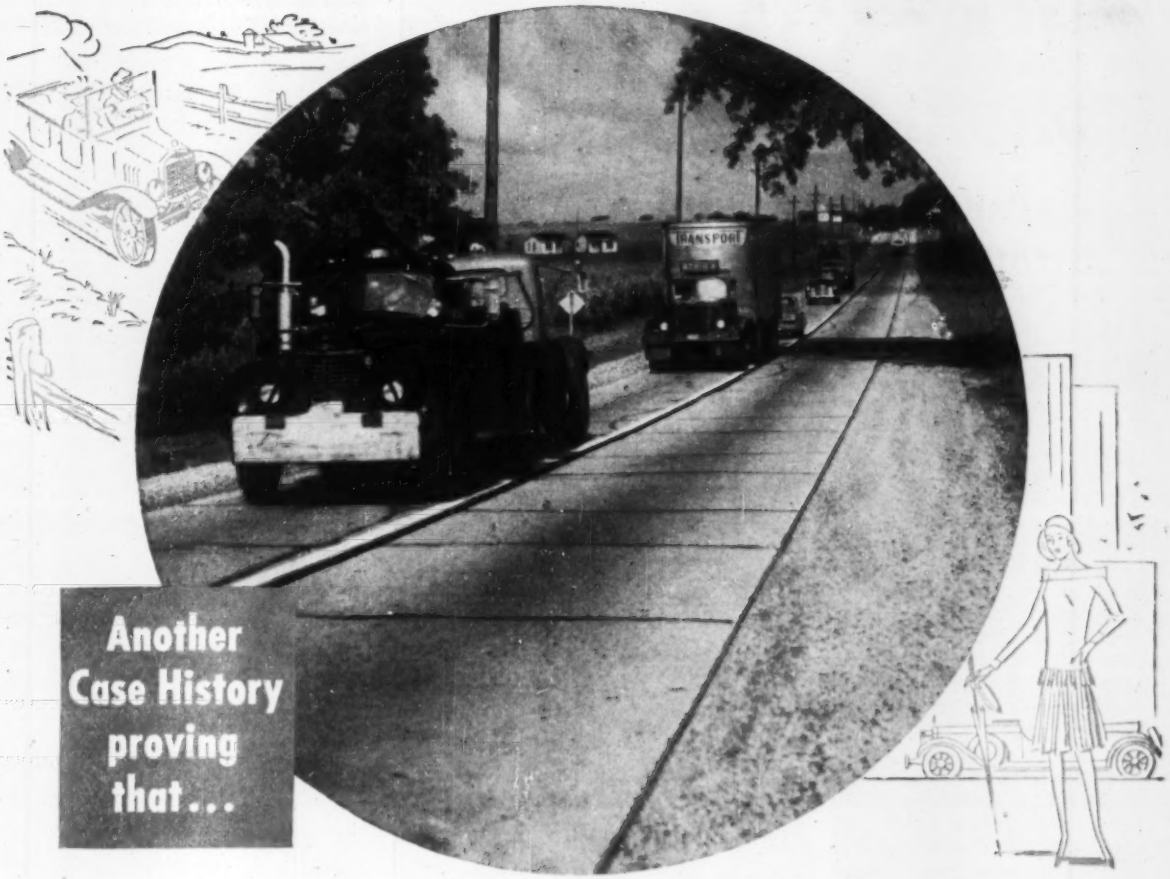
Ont., Orillia—SCHOOL—Orillia District High School Bd., Harry Tissington, chn., Orillia, high school addn. $375,000.

Ont., Petrolia—COUNTY HOME—Lambton Co., 283 N. Christian St., Sarnia, plans by Riddle, Connor & Assocs., 278 North Front St., Sarnia, 100-bed county home, $600,000.

Ont., Toronto—SCHOOL—Bd. Educ., 155 College St. replacing Queen Alexander School, 181 Broadview Ave. $770,000. F. C. Etherington, c/o owner, ch. engr. CD 12/15/43.

Ont., Toronto—FEDERAL—Dpt. P. Wks., Hunter Bldg., Ottawa, plans by A. E. Gardner, c/o owner, federal building for Dpt. National Health & Welfare, $300,000.

Ont., Toronto—SCHOOL—Bd. Educ., Etobicoke Twp. 4969 Dundas St. W., plans by Shore Moffatt, 79 Queen St. E., secondary school, Burnhamthrope Rd., $785,000. CD 5/19.



Concrete Roads Deliver Unexcelled Service and Economy

This old concrete road, U. S. 12 between Genoa City and Lake Geneva, Wis., built in 1923, is on a main route from Chicago to Minneapolis.

For more than 30 years it has handled increasingly heavy loads. Now it carries a daily average of 4500 vehicles, 1000 commercial.

By modern standards the design of this pavement is inadequate for such loads. Yet it goes on bearing this burden—as do hundreds of miles of other concrete roads throughout the country that have passed their life expectancies but continue to carry far beyond design loads.

These concrete roads were paid for long ago—by gas taxes collected from drivers using them. Yet they go on earning gas taxes that can be used to build needed new highways. Elsewhere other types of pavement have been replaced or rebuilt many times or have gobbled up an unduly large share of road funds just for maintenance.

Improved design, materials and methods assure even better performance today. You can build concrete roads that will last 50 years and more.

For more information about designing and building ***low-annual-cost, high-earning-capacity*** concrete roads write for free literature. It is distributed only in the United States and Canada.

Why Concrete is the best Pavement Buy

Moderate First Cost
+ Low Maintenance Cost
÷ Long Service Life
= **LOW ANNUAL COST**

PORTLAND CEMENT ASSOCIATION Dept. 6c-17, 33 West Grand Avenue, Chicago 10, Illinois

A national organization to improve and extend the uses of portland cement and concrete through scientific research and engineering field work

PLASTIMENT* CONCRETE DENSIFIER

CONTROLS SET AND REDUCES WATER CONTENT *WITHOUT CHANGING AIR CONTENT* FOR

- GREATER UNIFORMITY
- CRACK RESISTANCE
- WATER RESISTANCE
- SURFACE HARDNESS

*Plastiment consistently produces higher structural values in concrete because it limits and controls the growth of water-consuming cement gels during mixing and placing of concrete. This action reduces the water-cement ratio and retards the set of all concretes, plain or air-entrained, regardless of type of cement or aggregate. Uniformity of set and water content (the governing factors of uniform concrete quality) are made possible by changing Plastiment proportions with concrete-placing-temperatures and field conditions.

Controlled set and uniformly low water content—exclusive with Plastiment—means less segregation, shrinkage, cold joints and other defects, greater uniformity and resistance to abrasion, cracking and leakage.

Write for your copy of "Plastiment Concrete Densifier" booklet and the Sika Job Bulletin describing the job at right. ➔

11 APARTMENT HOUSES AT PARKMERCED, SAN FRANCISCO
REINFORCED CONCRETE WITH PLASTIMENT

For details on the above project, write for "SIKA JOB BULLETIN #8."

Sika

SIKA CHEMICAL CORPORATION
PASSAIC, NEW JERSEY
BRANCH OFFICES: PITTSBURGH, SALT LAKE CITY, MONTREAL, CHICAGO, PANAMA • DEALERS IN PRINCIPAL CITIES

DUDGEON HYDRAULIC JACKS
SALES RENTALS
• CAPACITY TO 600 TONS
FOR:
PILE TESTING
• UNDER-PINNING
• BRIDGES
• PIPE PUSHING
• SOIL TESTING

RICHARD DUDGEON INC.
709 BERGEN ST. • ST 6-4040 • BROOKLYN, N. Y.

TEST BORINGS for
• COAL
• MINERALS
• DAMS & BRIDGES
• BUILDINGS
We Lead in the South

PENNSYLVANIA Drilling CO.
DRILLING CONTRACTORS AND MFRS.
PITTSBURGH 20, PA.

COMMERCIAL BUILDINGS

▲ **Calif., San Francisco**—DORMITORY—Bd. Trustees, Stanford University, Balfour Bldg., 700-men mens' dormitory. $3,500,000.

Colo., Denver — OFFICE — Phillip Shaiman, Glenwood Springs, 3 story office with 2 underground parking levels, $625,000.

Conn., Wethersfield—CHURCH—Methodist Church of Wethersfield, 131 Main St., church, Over $300,000.

▲ **Conn., Windsor**—DORMITORY, etc.—Loomis Institute, Bd. Trustees, James Lee Loomis, pres., Loomis Rd., plans by Sherwood F. Jeter, Jr. & Assoc., 36 Pearl St., Hartford, dormitory, science facilities, enlarged auditorium, gymnasium Chaffee School, enlarging dining facilities and addn. 2 wings for Seller Hall, $1,300,000.

▲ **Ga., Atlanta**—OFFICE—Fulton Co. Federal Savings & Loan Assoc., 26 Pryor St. N.E., office bldg. $3,000,000.

▲ **Ill., Chicago**—OFFICE—Harris Trust & Savings Bank, 115 W. Monroe St., plans by Skidmore, Owings & Merrill, 100 W. Munroe St., 20 story, 3 bsmnt., steel, granite, stainless steel office, Clark St. between Monroe and Adams Sts.

Kan., Wichita—BANK—Fourth National Bank, Douglas Ave. and Market St., plans by Thomas, Harris & Calvin, 321 W. 2 St., Wichita, bank addn. $600,000.

Mich., Detroit—CHURCH—Calvin Presbyterian Parish, 13940 Hubbell St., Zone 27, by Earl L. Confer, 14000 Strathmore St., Zone 27, brick, concrete church plant. $300,000.

▲ **Mich., Flint**—HOMES—Sharp Homes, Inc., Michael Hamady, Flint, 370 acre development, incl. 1750 ranch type homes, shopping center, $20,000,000.

Mo., Columbia—BANK—Columbia Savings Bank, 9th. and Broadway, plans by Bank Building & Equipment Corp. of America, 9006 Sidney St., St. Louis, bank, $300,000.

Mo., Joplin—CHURCH—First Baptist Church, Seventh and Pearl Ave., plans by Robert Braeckel, 1204 Broadway, Joplin, and W. A. Harrell, assoc. archt., mgr.-Architectural Dpt. Southern Baptist Convention, Nashville, Tenn., church addn. $325,000.

N. H., Manchester—CHURCH—St. Theresa's Parish, Rev. D. P. Desrisseaux, pastor, Manchester, church, Calef Rd. Approx. $300,000.

N. Y., Brooklyn—SCHOOL—R. C. Church of St. Leonard of Port Maurice, 91 Jefferson St., Zone 6, plans by Beatty & Berlenbach, 32 Court St., Zone 2, 1 story parochial school, 271-283 Melrose St. $385,000.

N. Y., Jamaica—APARTMENT—Shelton Constr. Corp., c/o George Miller, archt., 19 W. 44 St., New York, Zone 36, 6 story apartment, 89 Ave. and 163 St. $300,000.

▲ **Ore., Portland**—OFFICE—Pacific First Federal Savings & Loan Assn., 811 Southwest 6th St., plans by Glen Stanton, Concord Bldg., office. $1,400,000.

▲ **Ore., Prineville**—HOTEL—L. P. Gibson & George Saites, Prineville, land purchased for hotel, $1,000,000.

▲ **Ore., Salem**—STORE—Meier & Frank Co., 621 S. W. 5 St., Portland, department store. $3,000,000.

▲ **Pa., Pittsburgh**—APARTMENTS—Noble Manor Development Co., Grant Bldg., plans by Nathan Cantor, 121 S. Negley Ave., 10 two story bsmnt., brick, block, steel apartments, 210-families, Noblestown Rd. $2,000,000.

▲ **Tenn., Knoxville**—NURSES RESIDENCE—St. Marys Hospital, Oak Hill Ave., nurses residence. $1,000,000

Tenn., Memphis—APARTMENT—Coe Stone, Cotton Exchange Bldg., plans by James H. Perrell, Hickman Bldg., apartment, $400,000.

Tex., Beeville—HOUSING—Beck-Williamson, Harlingen, 100-rental housing units. $765,000.

Tex., Beeville—DWELLINGS—Beeville Housing Corp., Mineral Wells, 28 dwellings, $310,000.

Tex., Corsicana—BANK, etc.—First National Bank, Corsicana, plans by Preston M. Geren, 1607 Fort Worth Natl. Bank Bldg., Fort Worth, 3½ story, steel, brick, stone bank-office, pier-beam fdn. $500,000. Yandell, Cowan & Love, Fort Worth Natl. Bank Bldg., Fort Worth, consult. engrs. CD 1/6.

Tex., Fort Worth—DORMITORIES—Texas Christian University, Fort Worth, reconstruct existing Dormitories, No. 1, $325,000; No. 2, $300,000; No. 3, $335,000.

Tex., Houston—EDUCATIONAL—First Methodist Church, Main St., plans by H. Edward Maddox, 3501 Buffalo St., rehabilitation and remodeling educational bldg. $387,000. CD 3/18/49.

▲ **Tex., Houston**—SHOPPING CENTER—Oscar Holcombe & Sterling Hogan, Sr., First Natl. Bank Bldg., masonry type shopping center, 60-70 store units, South Park Blvd. and Griggs Rd., 26-acre tract. $3,500,000.

▲ **Tex., Houston**—DWELLINGS—Frank W. Sharp, 2202 Rosslyn St. 30 dwellings, $360,000; 25 dwellings, $315,500; 28 dwellings, $344,150; 39 dwellings, $389,125; 41 dwellings, $398,165; 33 dwellings, $377,190; 37 dwellings, $368,700, an exten. of Scenic Woods.

▲ **Tex., Houston**—DWELLINGS—Frank Sharp, 3201 Oak Grove St., group of 36 dwellings, $305,000; 45 dwellings $379,120; 41 dwellings, $355,165; 30 dwellings, $317,500; 28 dwellings, $310,500; 34 dwellings, $341,000, Second Sect. development north of Halls Bayou.

CUT BUILDING COSTS

with RUBEROID Corrugated Asbestos Sheets

Skeleton construction with Ruberoid Corrugated Asbestos Sheets can cut costs and save time.

When used as siding and roofing over skeleton framework, these strong sheets permit lighter footings, foundations and framework.

Besides being fireproof, weatherproof and non-corrosive, Corrugated Asbestos Sheets eliminate the cost of painting and maintenance. They are used extensively in chemical plants, oil refineries and other places where the destructive effects of acids, fumes, smoke or steam are extreme. At the same time they are being used with pleasing effects for office walls, lobbies, display centers, etc.

You can figure exactly how to use the virtues of corrugated sheets to best advantage with the aid of Ruberoid's Corrugated Asbestos Catalog. It contains specifications, assembly instructions and detail sketches. See AIA File No. 12-F, or write or call nearest district office listed below.

Engineering consulting service, including take-offs on request.

The RUBEROID Co.

Executive Offices: 500 Fifth Ave., New York 36, N. Y.

Asphalt and Asbestos Building Materials

DISTRICT SALES OFFICES

Baltimore 24, Md.	1500 So. Ponca Street
Chicago 1, Ill.	307 N. Michigan Avenue
Dallas, Texas	Singleton Road
Denver 16, Colo.	156 W. 56th Avenue
Erie, Pa.	16th Street
Kansas City 3, Mo.	7600 Truman Road
Millis, Mass.	Curve Street
Minneapolis 11, Minn.	50 Lowry Ave. North
Mobile 8, Ala.	Emogene Street
St. Louis 15, Mo.	9215 Riverview Drive
Salt Lake City, Utah	1674 Beck Street
South Bound Brook, N. J.	Canal Road
Savannah, Georgia	P. O. Box 1183

TIME-SAVING HELP

in solving problems of hydraulics engineering

Here in compact, accessible form are the many tables and other reference data required by the practicing hydraulics engineer who wants to speed his computations without sacrificing accuracy. This well-known handbook covers every phase of common practice as well as many special problems. It condenses and simplifies rules and formulas. It clearly explains the practical application of all the many tables and diagrams. The Fourth Edition includes information on fluids other than water, modern material on orifices and sluice gates, weirs, pipes, uniform and nonuniform flow in open channels, etc.

Fourth Edition—Just Published

HANDBOOK OF HYDRAULICS

By **HORACE W. KING**, Former Professor of Hydraulic Engineering, University of Michigan.
Revised by **ERNEST F. BRATER**, Professor of Hydraulic Engineering, University of Michigan.

567 pp., 165 illus., 133 tables, $8.00

The Fourth Edition features . . .

. . . **revision of material** to include data on fluids other than water. Some of the material on weirs has been modernized and improved, while the discussion on submerged weirs has been completely revised. The chapter on pipes reflects advances made in recent years as does the revised material on uniform flow in open channels.

. . . **simplified computing** of critical depth for trapezoidal, triangular, circular, and parabolic channels. This is accomplished by arranging tables with the variables grouped in dimensionless form. A similar table for computing the depth after a hydraulic jump in trapezoidal channels has been included.

. . . **133 tables** aimed to help today's engineers solve all types of hydraulic problems. These tables include:

- Kilowatts to horse-power and horsepower to kilowatts
- Theoretical velocities for heads of 0 to 5, 50, and 500 feet
- Coefficients of discharge for culverts
- 1.47 powers of numbers
- Coefficients for weirs of triangular section with vertical upstream face and sloping downstream face
- Loss of head at entrance to pipe
- Permissible canal velocities after aging
- Determination of slopes by Manning formula
- Mean depths of trapezoidal channels

. . . and much more!

10 DAYS' FREE EXAMINATION

McGraw-Hill Book Co., Inc., Dept. NR-6-17
330 West 42nd Street, N. Y. C. 36

Send me **HANDBOOK OF HYDRAULICS 4th Edition** for 10 days' examination on approval. In 10 days I will send $8.00 plus few cents for delivery or return the book postpaid. (We pay for delivery if you remit with this coupon: same return privilege.)

(Print)
Name .....
Address .....
City .....Zone....State.....
Company .....
Position .....
(This offer applies in U. S. only) NR-6-17

▲ **Tex., Houston**—DWELLINGS—Jim West & Assocs., 226 Winkler St. (1) 30 dwellings, $309,600, (2) 27 dwellings, $300,000, (3) 38 dwellings, $349,150, (4) 41 dwellings, $370,000, (5) 36 dwellings, $357,165, (6) 33 dwellings, $330,500, (7) 45 dwellings $395,-175, (8) 48 dwellings, $410,000, in Second Sect. of 400-acre tract.

Tex., Killeen—CHURCH—First Baptist Church, Killeen, plans by George L. Dahl, 2101 N. St. Paul St., Dallas, 2 story brick, solid masonry church proj. (auditorium-educational). $325,000.

▲ **Tex., Pasadena**—DWELLINGS—Marvin Henry Builders, Inc., 2002 Chippendale St., Houston. (A) 42 brick dwellings, concrete slab fdn. $378,000, (B) 33 brick veneer dwellings, concrete slab fdn. $331,500, (C) 26 masonry dwellings, concrete slab fdn. $305,625, (D) 38 brick, stone dwellings, concrete slab fdn. $359,125, (E) 44 frame, masonry trim dwellings, concrete slab fdn., $392,150, (F) 35 brick, stone, frame dwellings, concrete slab fdn. $341,000, 240-acre tract, off Red Bluff Rd.

▲ **Tex., Pecos**—DWELLINGS—Western Abstract Co., Pecos, 26 frame dwellings, concrete slab fdn. $322,000; 32 brick dwellings, concrete slab fdn. $344,000; 36 frame, brick, stone dwellings, concrete slab fdn. $355,-500.

Tex., Richardson—DWELLINGS—Blagden Manning & Assocs., 4332 Beverly St., Dallas, 35 frame dwellings, concrete slab fdn. $345,000; 33 frame, masonry dwellings, concrete slab fdn., $328,500; 30 frame, brick dwellings, concrete slab fdn., $300,000 off Richardson Rd.

▲ **Tex., Spring Branch**—DWELLINGS—J. E. Lyons Building & Development Co., Prudential Bldg., Houston, (1) 34 dwellings, $361,000, (2) 38 dwellings, $379,-800, (3) 29 dwellings, $318,450, (4) 32 dwellings, $345,000, (5) 46 dwellings, $465,850, (6) 42 dwellings, $419,150, (7) 49 dwellings, $614,900, in second 40-acre tract off Campbell and Neuens Rds.

Tex., Wichita Falls—CHURCH—First Presbyterian Church, Wichita Falls, church. $300,000.

Wash., Mount Vernon—HOSPITAL—Mount Vernon Hospital Foundation, Mount Vernon, plans by W. A. Johnson, First National Bank Bldg., Everett, hospital. $500,000.

Man., Winnipeg—APARTMENT BLOCK—Dr. B. J. Ginsberg, c/o Zoning Bd., Winnipeg, 6 story, 75x230 ft., 48-suite apartment block, Wellington Crescent. $400,-000.

N. B., Moncton—CHURCH—Roman Catholic Parish of St. Augustine, Moncton, plans by Jean & Dupere, 181 St. Jean St., Quebec City, Que., church, $300,-000.

▲ **Ont., Byron**—DWELLINGS—Suzuki Brothers, B. Suzuki, mgr., 461 Dundas St., London, 60 brick dwellings. $1,000,000. W. M. Veitch, 18 Evergreen Ave., London, consult. engr.

▲ **Ont., Toronto**—HOTEL—E. G. Pigott & H. S. Steinberg, 2424 Yonge St., plans by Gordon S. Adamson, 52 St. Clair Ave. E., 2 story, one story wing, brick, steel hotel, O'Connor Dr. and Sunrise Ave. $1,000,000.

▲ **Ont., Windsor**—UNIVERSITY BUILDING—Assumption College, Very Rev. C. E. LeBel, pres., Windsor, university bldg., Tecumseh and Huron Rds. $1,000,000. CD 1/3/45.

Sask., Yorkton—HOTEL—Charles Hoffman, Whitewood Hotel, hotel, 1 Ave. at Smith St. $350,000.

INDUSTRIAL BUILDINGS

Ark., Crossett—PLANT—Textile Paper Products, Inc., Cedartown, Ga., plant. $100,000.

Conn., Hamden—FACTORY—Soundscriber Corp., 146 Munson St., New Haven, plans by Leo F. Caproni, 1221 Chapel St., New Haven, 1 story, 60,000 sq. ft. factory, Skiff St. and Wilbur Cross Highway, $600,000.

Fla., Pensacola—PLANT—Borden's Dairy, 3310 Florida Ave., Tampa, plans by Yonge, Look & Morrison, P.O. Box 46, dairy plant. $450,000.

▲ **Ind., Indianapolis**—SERVICE CENTER—Indianapolis Power & Light Co., 19. N. Meridian St., Zone 6, plan by Allen & Kelley, Architectural Builders Bldg., Zone 4, brick, structural steel, brick service center, 3600 N. Arlington Ave. $936,000. CD 6/29.

La., New Orleans—PLANT—Southwest Steel Products Co., Kenner, plans by Wm. R. Burk, 632 Pirates Alley, plant. $600,000. CD 5/14.

La., New Orleans—WAREHOUSES—Steel Service, Inc., c/o L. W. Benz, engr., 922 St. Louis St., warehouse. $200,000.

Mich., East Detroit—SHOP—Upton Furnace Co., East Detroit, plans by Donaldson & Meier, 1265 Griswold St., Detroit, 20,000 sq. ft. brick, masonry shop. $120,000.

Neb., Omaha—WAREHOUSE—Nebraska Tractor & Equipment Co., 1516 Leavenworth St., plans by J. T. Allan, Brandeis Theatre Bldg., warehouse. $150,000.

Neb., Schuyler—GRAIN ELEVATOR—Wagner Mills, Inc., Schuyler, grain elevator. $250,000.

N. Y., Long Island City—WAREHOUSE, etc.—Capitol Distributors Corp., 345 Hudson St., New York, Zone 14, plans by Leo Berger, 356 Fulton St., Brooklyn, Zone 11, 2 story warehouse and office, Thomson Ave. $350,000.

N. Y., New York—FACTORY—Sorkay Realty Co., Inc., 80 South St., Zone 7, plans by Hurley & Hughes, 51 E. 51 St., Zone 22, factory, 82-83 South St., $298,000.

N. C., Statesville—PLANT—Statesville Daily Record, Statesville, plans by Andrew L. Pendleton, Statesville, newspaper plant addn. $100,000.

DRY UP FAST WITH "Foundation WELLPOINTS"

Get PRE-BID estimates by competent, practical construction men who have specialized in all phases of dewatering for up to 26 years.

All estimates based on careful analysis of sub-soil borings, on actual experience in the soils to be dewatered, and on site investigations.

When soil conditions indicate other dewatering methods are more practical and economical, we are qualified to advise other proven methods.

26 YEARS EXPERIENCE

Foundation Equipment CORPORATION

Long Island City 1, N.Y.	Chicago, Illinois
38th Ave. and 10th St.	2608 W. 111th St.
EXeter 2-1100	Hilltop 5-8282

ONLY

TRI-LOK

OPEN STEEL FLOORING

Gives you all these Service Features!

★ ★ ★

Can be fabricated from a variety of metals

FREE CATALOG

Write today for Bulletin QK-1102-465

Locked-in Strength

Cross bars are locked in place under 1600 tons pressure. This assures permanent rigidity and a flush top surface.

Clinch-Lock Cross Bars

Bent-over bars lock assemblies into permanent integrated panels.

Self Cleaning

Better than 80% open area assures self cleaning.

DRAVO CORPORATION

National Distributor for THE TRI-LOK COMPANY

Dravo Building • Fifth and Liberty Avenues
Pittsburgh 22, Penna.

Tenn., Nashville—PLANTS—Nashville Mill & Lumber Co., 22 N. 6 St., plans by Howard Hickerson & Jordan, 3044½ Third Ave. N., two poured-concrete and steel plants on 1,300 ft. long triangular lot each building containing 50,000 ft. floor space. $430,000.

Tex., Deer Park—PLANT—The Lubrizol, Inc., Deer Park, chemical plant expansion on Ship Channel. $500,000.

▲ **Tex., Deer Park**—PLANT—Rohm & Haas, Deer Park, expansion of chemical plant facilities on Ship Channel. Approx. $1,000,000.

▲ **Tex., Houston**—PLANT—E. I. duPont de Nemours & Co., Chemicals Div., Bank of Commerce Bldg., expansion of chemicals plant on Ship Channel. Approx. $3,000,000.

▲ **Tex., Houston**—PLANT—Mathieson Industrial & Hydrocarbon Chemicals Div. of Mathieson Chemicals Corp., Gulf Bldg., chemical plant expansion on Ship Channel. Approx. $1,000,000. CD 2/21/51.

▲ **Tex., McGregor**—PLANT—Phillips Petroleum Co., c/o E. F. Kindsvater, McGregor, constr. addnl. sect. or sections of a Jato Plant for U. S. Air Force. $2,750,000.

Ont., Kitchener—FACTORY—Ardelt Industries of Canada Ltd., c/o Ed. Voickmar, 980 St. Antonio St., Montreal, Que., plans by Barnett & Rieder, 154 W. King St., 40x105x150 ft., concrete, steel factory. $180,000.

Que., St. Jean Des Piles—FACTORY—Cadorette Canoe Co., St. Jean Des Piles, reconstr. factory. $100,000.

UNCLASSIFIED

Calif., Piedmont—SWIMMING POOL—City, City Hall, $100,000 bond election June 8, swimming pool for Piedmont Recreation Center. $100,000. CD 4/22/48.

Colo., Denver—TELEVISION STUDIO—Bd. Educ., Administration Bldg., 414 14 St., KRMA-TV Television studio addn. $100,000.

Fla., Orlando—SWIMMING POOLS—City, City Hall, 2 swimming pools. $100,000. A. P. and R. K. Michaels, Church and Main Bldg., consult. engrs.

▲ **Maryland**—TUNNEL—State Rds. Comn., 108 E. Lexington St., Baltimore, signed a contract with Stingstad & Baillie, 24 State St., New York 4, N. Y. to design and construct Patapsco Crossing Vehicular Tunnel from Caton to Fairfield, under Baltimore Harbor, $144,000,000. J. E. Greiner Co., 1201 St. Paul St., Baltimore, and Joseph K. Knoerle Assoc., Inc., 824 N. Calvert St., Baltimore, assoc. engrs. CD 7/10.

▲ **Mich., Detroit**—PORT DEVELOPMENT—City, City Plan Comn., 1214 Griswold St., plans by H. E. Beyster & Assoc., Inc., engr.-archt., 2000 Industrial Bank Bldg., port development, docks, warehouse facilities, lagoons 2,100 ft. long and 800 ft. wide, dredged to handle ships 9,000 tonnage, railroad sidings. $5,500,000. CD 9/11/44.

Mich., Monroe—SWIMMING POOL—City, D. A. Soleau, clk., indoor-outdoor swimming pool, Cantrick Junior High School. $100,000.

▲ **Mississippi**—RURAL DISTRIBUTION LINES—Yazoo Valley Electric Power Assoc., Yazoo City, 404 mi. rural distr. lines, sys. imprvs., Yazoo Co., $1,175,000.

Nebraska—RURAL DISTRIBUTION LINES, etc.—South Central Membership Assoc., Nelson, 86 mi. electric distr. line, 1 mi. 34.5 kv transmission line, sub-station facilities and sys. imprvs., Webster Co. $440,000.

† **N. J., Somerville**—STORAGE AREAS—General Services Admin., P. Bldgs. Service, General Services Bldg., Wash., D. C., storage areas, and service tracks at Veterans Administration Supply Depot, Warehouses 1, 2, 3 and 4.

▲ **N. Y., New York**—SHUTTLE—New York City Transit Auth., 370 Jay St., Brooklyn, Zone 1, cross town conveyor shuttle from Times Square to Grand Central Stations. $1,800,000.

O., Greenmont—SWIMMING POOL—Village, Greenmont, swimming pool, Patterson Rd., Rembrandt Blvd., and Flesher Ave. $126,000.

South Dakota—RURAL DISTRIBUTION LINES—McCook Electric Co-operative, Salem, S. D., 33 mi. rural distr. lines and sys. imprvs., McCook Co. $112,000. REA allot. United Eng. Service, Huron, consult. engr. CD 5/17.

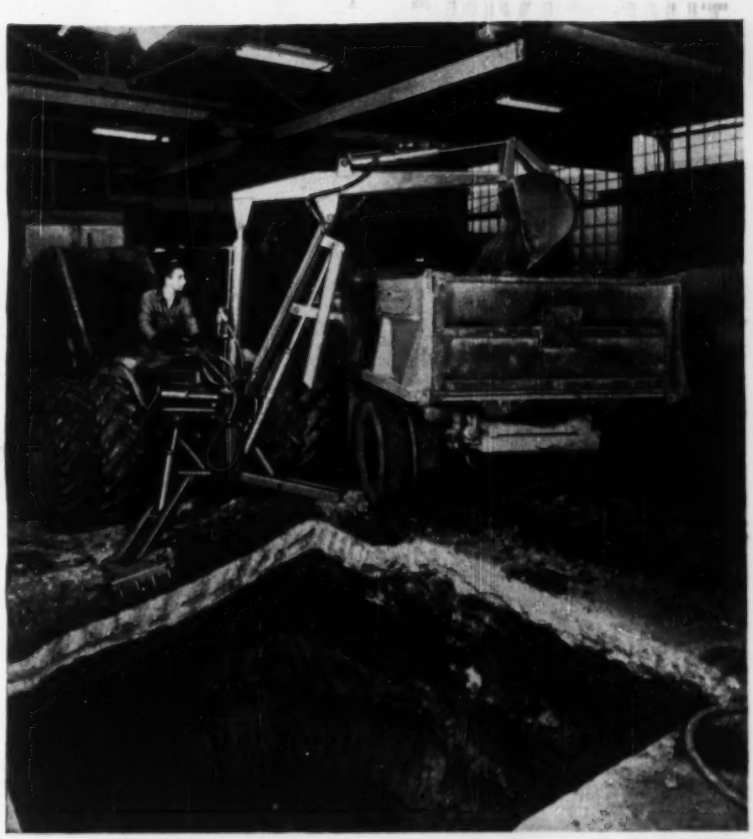
▲ **Texas, Oklahoma, Kansas**—OIL LINE—Shamrock Oil & Gas Co., 1st Natl. Bank Bldg., Amarillo, Tex., 115 mi. 6 in. crude oil line from near Dumas to Novinger oil field in Meade Co., Kan., $1,380,000; crude pumping station, at Turpin (2½ mi. north), Okla. $375,000.

Texas—GAS LINES—Lone Star Gas Co., 301 S. Harwood St., Dallas, approx. 20 mi. 12 in. interconnecting gas lines in an extension of transmission sys., Tyler area, Smith Co., $275,000; 16.5 mi. 6 in. gas lines to tie into Gulf's gasoline plant, Ballinger area, Runnels Co., $145,000; 17.6 mi. 8 in. gas line from Katz Field, Stonewall Co. to near Weinert, Haskell Co., $175,000. CD 6/19/50.

Texas—RURAL DISTRIBUTION LINES, etc.—Rio Grande Electric Co-operative, Inc., Bracketville, 520 mi. rural distr. lines, 77 mi. transmission lines, power substation, Bracketville area, Kinney Co. $1,750,000. REA allot. CD 4/4/52.

▲ **Tex., Mineral Wells**—TOURIST RESORT—State Park Bd., State Admin. Bldg., Austin, tourist resort at Possum Kingdom area near here, $1,000,000. CD 10/23/44.

Que., Riviere du Loup—WHARF—Dpt. P. Wks., Hunter Bldg., Ottawa, Ont., wharf enlargements. $100,000. A. A. Anderson, c/o owner, engr.



Get Into Tight Spots at a Profit ...With a Sherman Power Digger!

Here's real proof of the compactness and maneuverability of the Sherman Power Digger! The job: Dig a 6 foot deep machine foundation hole 10 feet square in a working area only 20 feet square, with overhead beams and lights reducing the ceiling limit to less than 10 feet in some spots.

The floor was 8 to 10 inches of concrete, reinforced with ¼ inch steel rod. It was broken up with air tools, then loaded into a dump truck by the digger. Manual loading would have been difficult because of the reinforcing rods, but these presented no problem when loaded mechanically.

Digging and loading took less than four hours, in spite of the limited maneuvering area. Estimated time for hand labor: Three men working about 2½ days!

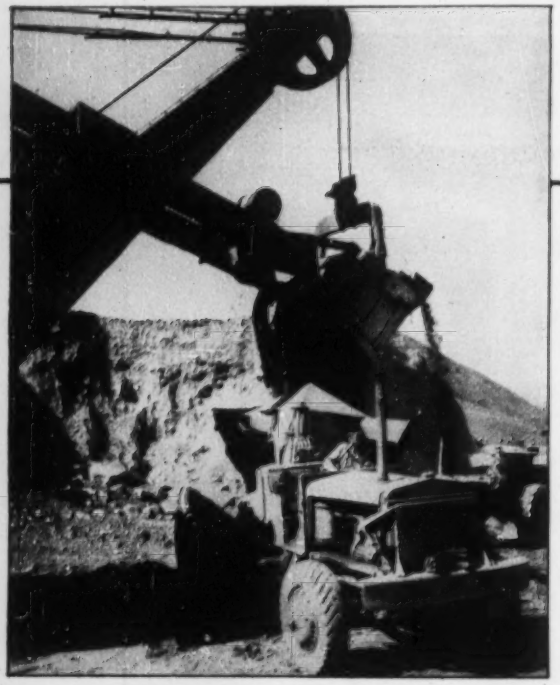
If you now excavate by hand, or if your heavier power equipment cannot work in tight spots, you'll profit with a Sherman Power Digger. It's compact, flexible, fast, easy to operate. It costs little to buy, less to maintain, quickly pays for itself. For the whole story, write today for Bulletin No 54-C.

Designed, Engineered and Manufactured Jointly by
SHERMAN PRODUCTS, Inc.
Royal Oak, Michigan
WAIN-ROY CORPORATION
Hubbardston, Mass.

Patent No. 2,303,852
Other patents pending

© SHERMAN PRODUCTS INC., 1954

Sherman
PRODUCTS, INC.
ROYAL OAK, MICHIGAN



SPECIFICATIONS SHOULD REQUIRE

CONSTRUCTION BONDS

Ask for . . .

NATIONAL SURETY CORPORATION

NEW YORK

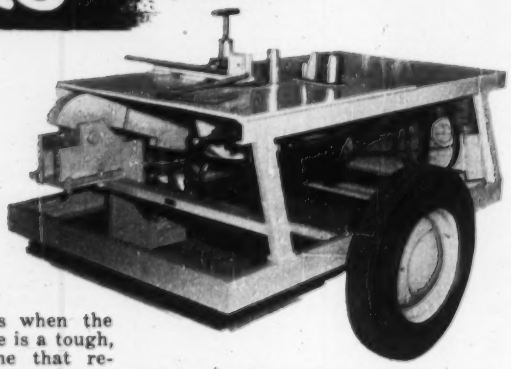
one of America's foremost surety companies

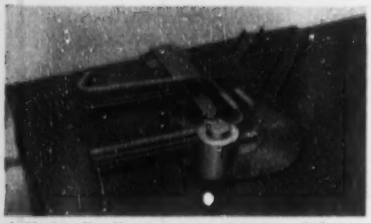
INVISIBLE ARMOR ®

This symbol on your bond or policy guarantees satisfaction

CONTRACTORS "THIS IS IT"

The IRON MAN *Hydraulic-Portable* ROD BENDER AND SHEAR





▲ Hydraulic disc forces bend in four ½" rods. Four stirrup hooks are bent at one time. ▼

WHAT IT IS:

You have a jump on costs when the IRON MAN takes over. Here is a tough, automatic, precision machine that reduces re-rod fabrication to seconds—on the job, where and when you want it.

WHAT IT DOES:

It works on location—tailors your metal to on the job needs, sheared to length, formed accurately to specifications in rods-per-minute volume. It earns extra profits for you.

WITH ALL THESE ADVANTAGES:

It's Durable!	It Cuts Costs!
It's Portable!	It Works Fast!
It's Hydraulic!	It's Accurate!
It's Automatic!	It's Efficient!

WRITE FOR FURTHER INFORMATION

Here's the only machine combining bending and shearing in a single portable unit. Mail this coupon today.

Acme Equipment, Inc.
Central Trust Building
Altoona, Pa.

Please furnish specifications, net prices and shipping information on the IRON MAN.

Name ----------

Street ----------

City ---------- State ----------

☐ Contractor ☐ Equipment Dealer

ACME EQUIPMENT, INC.

International Distributors
Central Trust Bldg., Altoona, Pa. Tel. 3-7911
Mfd. by Livingston Machine & Tool Co., Inc., Frostburg, Md.

NEW ENGLAND

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **NEW HAMPSHIRE**—State Dpt. P. Wks. and Hys., Concord,

Landers & Griffin, Inc., and **Morrison-Knudsen Co.,** 800 Islington St., Porthmouth, N. H., CA **$1,046,638.** bridge-highway, 3½ mi. hy., steel beam bridge, Portsmouth Newington. Bids Apr. 22, awarded May 17. CD 4/29, under LB.

▲ **CONNECTICUT**—State Hy. Comn., State Office Bldg., Hartford,

Mariani Constr. Co., 222 Forbes Ave., New Haven, Conn. LB **$1,132,053.** est. $1,000,000. South abutment wings, and pier footings for bridge carrying off ramp to Hamilton Ave. F. A. Proj. UI 138 (8) and grading, drainage, pavement and bridges, F. A. Proj. UI-136, Waterbury. Bids June 7. CD 5/25.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **NEW YORK**—Triborough Bridge & Tunnel Auth., Admin. Bldg., Randall's Island, New York Zone 35,

Horn Constr. Co., Inc., 2174 Hewlett Ave., Merrick, N. Y. LB, **$2,771,681,** Contr. QME-4, Queens Midtown Expressway, 80th St. to Queens Blvd. and bridges over 74 St. and New York Connecting R. R. Queens Boro. Bids June 2. CD 5/13.

▲† **Consolidated Constructors, Inc.,** 18 E. 41 St., New York 17, N. Y., CA, **$2,746,346,** AM dormitory, mess, commissary bldg., and AIO warehouse, FY 1953, 1954. Plattsburg Air Force Base. PLATTSBURG, N. Y. U. S. Eng., 80 Lafayette St., New York 13, N. Y. Bids May 4. CD 3/17.

▲ **NEW JERSEY and PENNSYLVANIA**—Pennsylvania Turnpike Comn. and New Jersey Turnpike Auth., Administration Bldg. of Pennsylvania Turnpike Comn., 11 No. Fourth St., Harrisburg, Pa.,

Merritt-Chapman & Scott Corp., 260 Madison Ave., New York 16, N. Y., CA, **$3,688,223,** substructure of six-lane, 76½-ft. wide bridge across the Delaware River to Connect the New Jersey and Pennsylvania turnpikes between Burlington and Bucks Counties. Bids May 25. CD 5/27, under 1B.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Kent-Brown-Furtsch, Inc.,** 384 E. 149 St., New York, N. Y., LB **$5,297,000,** general constr. and foundations;

Afgo Engrg. Corp., 475 Adelphi St., Brooklyn 17, N. Y., LB **$431,900,** heating and ventilating;

Wachtel Plumbing Co. Inc., 1345 Cromwell Ave., New York 52, N. Y., LB **$615,000,** plumbing;

Simpson Electric Corp., 71 E. 116 St., New York 29, N. Y. LB **$378,000,** electric for Baruch HOUSES, Proj. No. NY-5-12, Sect. II; incl. Bldgs. Nos. 6, 8, 9, 10, 11 and 16 and handball court area, in area bounded generally by E. Houston St., Baruch Pl., Stanton and Columbia Sts., and by northeasterly portion of area bounded generally by Stanton, Mangin, Rivington Sts. and Baruch Pl. and by northerly portion of area bounded generally by Stanton St., Baruch Pl., Rivington St. and Lewis St. and by area bounded generally by Stanton St., Lewis St., Rivington St. and Cannon St. and by area bounded generally by Rivington St., Baruch Pl., Delancey St., Lewis St. etc. Manhattan Boro. NEW YORK, N. Y. New York City Housing Auth. 63 Park Row New York 38, N. Y. Bids June 8. CD 5/17.

▲ **Country Gardens Homes,** c/o Vigilant Assoc. Inc., 1196 Fulton Ave., Uniondale, N. Y., Owner Builds, **$2,500,000.** 212 HOMES on tract at Clay Pits Rd., east of Larkfield Rd., EAST NORTHPORT, N. Y.

▲ **Northwood At Roslyn Homes,** c/o Stanley Klein, archt., 89-31, 161 St., Jamaica, N. Y. Owner Builds. **$2,000,000.** 75 HOUSES, 35 acre tract, Guinea Woods Rd. and Midwood Cross., ROSLYN, N. Y.

▲ **Eastlake Park Homes,** c/o Kern Realty Co., 124-26 Queens Blvd., Kew Gardens, N. Y. Owner Builds. **$2,250,000.** 175 HOUSES, 45-acre tract Carman Rd., SOUTH FARMINGDALE, N. Y.

▲ **Ralph Biernbaum,** 25 Exchange St., Rochester, N. Y. Owner Builds, **$2,000,000,** Columbia Park SHOPPING CENTER, incl. 34 stores on 17-acre tract on Hudson County Blvd. and Lincoln Tunnel Marginal highway, NORTH BERGEN, N. J. William Neumann & Sons, 587 Summit Ave., Jersey City, N. J., archts.

▲ **Moyer Bros.,** 2605 Beale Ave., Altoona, Pa., CA, **$1,311,000,** general constr., secondary SCHOOL bldg. for the Clearfield Area Joint School Bd. in Lawrence Twp. CLEARFIELD, PA. State P. School Building Auth., 101 S. 25 St., Harrisburg, Pa. Bids Apr. 29. CD 5/4, under LB.

▲ **National Engineering & Development Corp.,** 1200 16 St. N.W., Wash., D. C., Owner Builds, est. **$2,000,000.** 8 story APARTMENT, C St. Delaware Ave. and Canal St. S.W., WASH., D. C. Petticord & Mills, 3308 14 St. N.W., Wash., D. C., archts.

SOUTH

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **Duval Engrg. & Contg. Co.,** 1746 E. Adams St., Jacksonville, and **O'Laughlin & Hansen,** Box 2797 Jacksonville, CA, **$2,508,426.** parking area and ramps JACKSONVILLE, FLA. City, City Hall, Jacksonville, Fla. Bids Mar. 11. CD 2/4.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **City and Whitfield Co.,** Dalton, Ga. rejected bids May 13, HOSPITAL, CA **$1,197,250,** DALTON, GA. CD 6/2, under LB.

▲ **Russell V. Tunney,** Greenleaf Bldg., Jacksonville, Fla. Separate Contracts, **$1,280,000.** 128 one-story 800 to 1,500 sq. ft. concrete block and brick RESIDENCES, JACKSONVILLE, FLA.

▲ **J. Y. Gooch Co.,** Congress Bldg., Miami, Fla. CA Approx. **$3,000,000.** ARCHITECTURAL & CONSTRUCTION CENTER (office bldg., hotel, display bureau, garage, etc.), MIAMI, FLA. Dupont Plaza, Inc., 5040 Biscayne Blvd., Miami, Fla. CD 3/31.

MIDDLE WEST

BIDS ASKED—BUILDINGS

▲ **Ill., Harvey**—SCHOOLS—BA 6/29—School Dist. 152, 15148 Loomis St., elementary schools, (1) Wallace at 146 St.; (2) Vine and 144 St.; (3) Wood and 158 Sts.; (4) Finch and 160 Sts. $1,500,000. Louis Balluff, 35 E. Wacker Dr, Chicago Zone 1, archt. Westcott Engrg. Co., 205 W. Wacker Dr., Chicago 6, Ill., struct. engr. CD 11/20/53.

▲ **Mich., Coldwater**—HOSPITAL—BA 7/7—State, A. N. Langius, dir., State Bldg. Dpt., Lansing, 3 story, brick, steel concrete receiving hospital, Coldwater State Home & Training School. $1,500,000. Plans deposit $50. Harley, Ellington & Day, Inc., 153 E. Elizabeth St., Detroit, archt. CD 2/6/53.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲† **Sherry Richards Co.,** 228 N. LaSalle St., Chicago 1, Ill., CA **$3,398,393.** hospital and dental bldg., Chanute Air Force Base, Serial No. ENG 11-032-54-36. RANTOUL, ILL. U. S. Eng., Merchandise Mart, Chicago 54, Ill. Schmidt, Garden & Erikson, 104 S. Michigan Ave., Chicago 3 Ill., hospital archts. Reissner & Urbahn, 654 Madison Ave., New York, N. Y., dental bldg. archts. Bids May 14. CD 4/8.

▲† **Charles Harris Co.,** 474 University Ave., St. Paul, Minn. LB **$1,925,666.** exterior facilities at Badger Ordnance Plant, BARABOO, WIS. U. S. Eng., 428 Federal Bldg., Milwaukee, Wis. Bids June 3. CD 5/7.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Clark & Vinstein, Inc.,** 921 E. Washington St., Indianapolis, Ind. Owner Builds. **$3,000,000.** Ten $50,000 HOMES in Spring Mill area; twenty $25,000 homes on Meridian Hills Country Club Addn., 100 homes to cost $2,000,000, Clarke Heights Addn., INDIANAPOLIS, IND.

▲ **J. W. Cox,** 20063 James Couzens Hy., Detroit 35, Mich. Owner Builds, Est. **$1,100,000.** 90 brick ranch HOMES, Slocum, Mayfield, and Manning Sts. off Grand River Blvd., FARMINGTON, MICH.

Austin Building Co., 24733 Rensseler St., Oak Park, Mich. CA Est. **$500,000.** brick ranch HOMES, 12 Mile Rd., Greencastle and Inkster Rds., SOUTHFIELD, MICH. Woodbridge Realty Co., (agent), 23620 Woodward St., Detroit 20, Mich.

▲ **Northwood Building Co.,** 2328 Middlebelt Rd., West Bloomfield, Mich. CA Est. **$4,750,000.** 400 brick ranch HOMES, Orchard Lake, Square Lake and Middlebelt Rds., WEST BLOOMFIELD, MICH. Gordon-Williamson Co., 19180 Grand River St., Detroit 23, Mich.

WEST OF MISSISSIPPI

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

NORTH DAKOTA—State Hy. Dpt., Bismark,

Schultz & Lindsay Constr. Co., 621 1st Ave. N., Fargo, N. D., CA, **$886,049,** A.E.P.C. conc. pavement and incid. 11.144 mi., Proj. No. FI-I-365 (11), Pembina and Walsh Counties. Bids May 21. CD 5/27 under LB.

▲† **E. E. Barber,** 722 Wheeler St., Fort Smith, Ark., CA **$1,151,984,** relocating 8 steel, concrete bridges for St. Louis Southwestern Ry. Co. due to Texarkana Reservoir Proj. Serial No. CIVENG-16-047-54-186. TEXAS. U.S. Eng., foot of Prytania St., New Orleans, La. Bids May 14. CD 5/26, under LB.

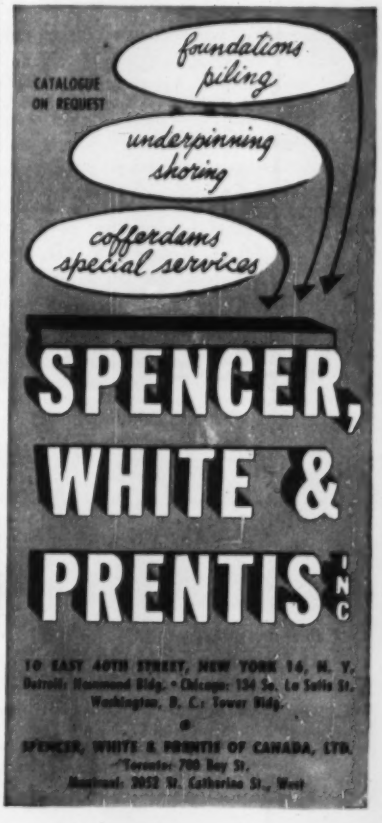
IF IT'S A

PLAY SAFE! ASK FOR A DEWATERING ANALYSIS BY

GRIFFIN

WELLPOINT CORP.

881 East 141st Street, New York 54, N. Y.
Hammond, Ind. Houston, Tex. Jacksonville, Fla.


foundations
piling
CATALOGUE ON REQUEST
underpinning
shoring
cofferdams
special services
SPENCER, WHITE & PRENTIS INC
10 EAST 40TH STREET, NEW YORK 16, N. Y.
Detroit: Hammond Bldg. • Chicago: 134 So. La Salle St.
Washington, D. C.: Tower Bldg.
SPENCER, WHITE & PRENTIS OF CANADA, LTD.
Toronto: 700 Bay St.
Montreal: 3052 St. Catherine St., West

How to Get MORE Out of Your Dragline

A SAUERMAN Crescent Scraper may DOUBLE its Capacity

Any dragline can handle a Crescent Scraper of greater capacity than its regular bucket or clamshell. The Crescent is much lighter, size for size. It hauls its load on the ground, being lifted only when empty.

Larger machines can usually double their capacity with a scraper. Smaller units move about 50% more.

When the scraper is equipped with a carrier and is used with a track cable, machine range is limited only by the spooling capacity of the hoist drums. So equipped, it can reach farther, extend deeper under water or take material out of soft areas without the nuisance of mats.

To find out how much you can increase your dragline capacity, tell us the make, model number and boom length of your machine. We will then determine the largest scraper your crane can handle and give you our recommendations.

For more information, send for:

Field Report 219: How to Make a Boom Machine Reach Farther and Dig More; and Catalog J: Crescent Scraper Buckets.

SAUERMAN BROS., Inc.

532 S. CLINTON ST., CHICAGO 7, ILL.

Core Drilling *by Contract*

Exploration for coal and other mineral deposits. Foundation test boring and grout hole drilling for bridges, dams and all heavy structures. ***Core Drill Contractors for more than 60 years.***

JOY MANUFACTURING CO.

Contract Core Drill Division • MICHIGAN CITY INDIANA

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Fluor Corp. Ltd.**, 2500 Atlantic St., Los Angeles, Calif. CA est. $15,000,000. ammonia PLANT, CRYSTAL CITY, MO. Mississippi River Fuel Corp., 407 N. 8 St., St. Louis, Mo.

▲ **Hardesty-Johnson Builders, Inc.**, 8230 Forsyth Blvd., Clayton 24, Mo. Owner Builds. est. $1,250,000. 192 RESIDENCES old Florissant Rd. north of Lindbergh Blvd., FLORISSANT, MO.

Gamble Constr. Co., 804 Pine St., St. Louis 1, Mo. CA $634,000. 1 and 2 story, approx. 90,000 sq. ft. steel, concrete masonry WAREHOUSE, 20,000 sq. ft. office loading dock to service trucks and railroad siding at Clayton Ave., Sarah St. to Taylor Ave., ST. LOUIS, MO. Graybar Electric Co., Inc., 2642 Washington Ave., St. Louis 3, Mo. CD 5/27, under LB.

▲ **Jansen Constr. Co.**, Box 6952, Dallas, Tex., LB $1,168,323. est $2,500,000. 5 story bsmnt., 155x200 ft. limestone, granite, marble, structural steel, etc., CITY HALL, to include fdn. for future 5 addnl. storys. DALLAS, TEX. City, City Hall, Dallas, Tex. Bids May 31. CD 5/11.

▲ **A. Mascari Constr. Co.**, 2130 Chantilly St., Houston, Tex., Own Forces, $327,500, 22 DWELLINGS; $378,000, 28 dwellings, in Sect. 6, Timbergrove Manor; $395,000, 28 one and two-story masonry dwellings, in area Loftus Oaks, HOUSTON, TEX. CD 4/19.

▲ **W. S. Bellows Constr. Co.**, Box 2132, Houston, Tex., CA. Total cost $16,000,000. 24-story BANK and OFFICE, HOUSTON, TEX. Second National Bank of Houston, 800 Main St., Houston, Tex. Bids May 4. CD 5/11, under LB.

▲ **C. O. Beeler and Ed. Brown & Assocs.**, 4715 Calhoun St., Houston, Tex., Owner Builds, $327,185, 34 frame DWELLINGS, concrete slab fdn.; $378,600, 40 frame dwellings, concrete slab fdn. $418,000. 46 frame, brick trim dwellings, concrete slab fdn. Grand total $1,121,785. PASADENA, TEX. CD 4/19.

FAR WEST

BIDS ASKED—BUILDINGS

▲ **Calif., San Francisco**—OFFICE—BA 6/29—Pacific Mutual Life Insurance Co., 660 Market St., 5 story office 100x119 ft. lot, $1,000,000. Loubet & Glynn, 333 Montgomery St., San Francisco, archts. CD 2/10.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **John H. Sellen Constr. Co.**, 228 9 Ave. N., Seattle, Wash., CA $1,581,168, fuel tank farm, shop bldg., drainage paving, etc. for $1,000,000 B-52 preflight facilities at Boeing Field, SEATTLE, WASH. BOEING Airplane Co., 7755 E. Marginal Way; Seattle, Wash. Bids May 26. CD 5/28 under LB.

▲ **CALIFORNIA**—State Div. Hys., 120 Spring St., Los Angeles,
Vido Kovacevich & Co. and O. B. Pierson, 3154 N. Rosemead Blvd., Rosemead, Calif. LB, $1,575,167. 2.2 mi. grading, surf. and 2 bridges on Artesia St., Los Angeles Co. Bids May 27. CD 5/5.

▲ **CALIFORNIA**—State Div. Hys., P. Wks. Bldg., Sacramento,
Parish Bros., P.O. Box 6, Benicia, Calif. and **Carl N. Swenson**, P.O. Box 558, San Jose, Calif. CA, $3,425,225. 8.6 mi. grading, paving various bridges and structures between Railroad Ave. and Petaluma Creek, Sonoma Co. CD 5/25, under LB.
Erickson-Phillips & Weisberg, 50 Market St., Concord, Calif. LB $998,828. water storage reservoir, L.S. 630, near Hayward, OAKLAND, CALIF. East Bay Municipal Utility Dist., 512 16 St., Oakland, Calif. Bids May 28. CD 5/12.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Jensen Constr. Co.**, 548 W. 2nd North St., Salt Lake City, Utah, CA $1,794,492. UNION BLDG., University of Utah, SALT LAKE CITY, UTAH State Building Bd., State Capitol, Salt Lake City, Utah. Bids May 12. CD 5/19, under LB.

▲ **Ditmars-Dickmann-Pickens Constr. Co.**, 319 Gazette Bldg., Little Rock, Ariz., CA $1,500,000. LUMBER MILL expans., FLAGSTAFF, ARIZ. Southwest Lumber Mills, Flagstaff, Ariz.

▲† **M. M. Sundt Constr. Co.**, Box 2592 Tucson, Ariz., LB, $1,616,600, 22 buildings, railroad spur, roads, etc., guided missile PLANT, TUCSON, ARIZ. Hughes Aircraft Co., Culver City, Calif. Bids June 3. CD 5/19.

▲ **Biltwell Constr. Co.**, 4745 Geary St., San Francisco, Calif. CA $3,047,777. Hunters View HOUSING Proj. CA1 1-18 Site 3, SAN FRANCISCO, CALIF. Housing Auth. of City and County of San Francisco, 440 Turk St., San Francisco, Calif. Bids May 27, awarded May 28. CD 5/3.

▲ **Maino Constr. Co.**, San Luis Obispo, Calif. LB $1,474,300. general contract;
Hickman Bros., Inc., 3170 E. 11 St., Los Angeles, Calif. LB $399,490. mechanical work for SCIENCE AND CLASSROOM bldgs. and site development for California Polytechnic College, SAN LUIS OBISPO, CALIF. State Div. Architecture, 1100 S. Grand Ave., Los Angeles, Calif. Bids May 26. CD 5/5.

▲ **Rothschild, Raffin & Weirick**, 274 Brannan St., San Francisco, Calif. LB $3,607,500. Hillsdale High SCHOOL, located on south side of 31 Ave. between Alameda de Las Pulgas and Del Monte St., SAN MATEO, CALIF. Bd. Trustees of San Mateo Union High School Dist., San Mateo, Calif. Bids May 26. CD 5/13.

Limerock base road, storm sewers in Florida

Low bidder H. E. Wolfe Constr. Co. of St. Augustine won a $1,123,213 job from the Florida State Road Department for 2.729 mi of State Road No. 55 in St. Petersburg. The contract figure is 6% less than second low bid, and lowest of five. Acting State Highway Engineer is R. T. Gupton.

To be built is a limerock base road with bituminous concrete surface, concrete sidewalks, and 12,025 ft of storm sewers.

Construction must be completed in 302 working days. Wage rates in the area include $2.35 per hr for carpenters.

Bidders include:

1C	H. E. Wolfe Constr. Co., St. Augustine, Fla.	$1,123,213
2	W. L. Cobb Constr. Co., Tampa, Fla.	1,188,639
5	J. W. Conner & Sons, Inc., Tampa, Fla.	1,340,011

Bids: 4-30-54 Item	Unit	Quantity	Unit Prices 1C	2
Clear & grub, rdway	ac	36.3	$135.00	$346.50
Excav, regular	cy	86,077	0.40	0.61
Excav, subsoil	cy	827	0.40	0.33
Stabil rdbed, 40 lb per sl BV*, 6" deep	sy	5,486	0.12	0.13
Stab rdbed, 75 lb BV* 12" deep	sy	120,549	0.24	0.275
Miami rock base, 8"	sy	110,517	no bid	no bid
Ocala rock base, 8"	sy	110,517	1.40	1.40
Prime material	gal	22,103	0.22	0.19
Tack coat material	gal	17,678	0.16	0.155
Asph conc surf crs—1" th, bndr crs—1½"	sy	110,517	0.70	0.73
Bit mat for asph conc	gal	170,605	0.125	0.127
Conc for hdwalls & culverts	cy	7,900	48.00	52.80
Conc for retaining walls & steps	cy	10	65.00	49.50
Reinf stl	lb	1,121,000	0.10	0.08
Conc pipe culv:				
15-in storm sew	lf	1,365	3.80	5.50
18 " " "	lf	1,949	5.40	6.60
24 " " "	lf	1,879	7.60	7.70
30 " " "	lf	318	10.10	12.10
36 " " "	lf	1,079	12.50	15.13
42 " " "	lf	2,300	16.00	17.60
48 " " "	lf	1,606	19.70	20.50
54 " " "	lf	709	24.60	27.00
60 " " "	lf	1,021	28.20	29.70
Sand-cement riprap	cy	25	30.00	33.00
Underdrain, 6"	lf	300	2.25	2.05
Inlets, std	ea	95	272.00	302.50
Inlets, special	ea	15	230.00	137.50
Manholes, std	ea	15	380.00	357.50
Manholes, special	ea	4	195.00	148.50
Conc curb, 8"x20" head	lf	312	2.00	1.95
median "A"	lf	11,341	1.60	1.49
and gutter	lf	24,023	1.55	1.54
Conc valley gutter	lf	768	2.00	1.60
Conc sidewalk, 4" thick	sy	12,580	3.00	2.97
6" thick	sy	1,324	4.00	3.96
ROW markers, instl	ea	8	2.00	1.65
Mulch material	ton	28.5	35.00	55.00
Sprig, seed & mulch	sy	46,000	0.05	0.08

* BV—Bearing value

Hudson River bridge bid on substructure low by 14%

Merritt-Chapman & Scott Corp. went $731,000 below the second bid to win the $4,495,477 Kingston-Rhinecliff Bridge substructure contract from New York State Bridge Authority, James F. Loughran, Chairman. Consulting engineer is David B. Steinman of New York.

The substructure consists of eight river piers, 22 land piers, and two abutments. All piers are of reinforced concrete. River piers rest on steel H-piles driven to rock; they vary in height from 128' 11" to 194' 4" above mean low water. Land piers rest on rock or concrete bearing piles.

Differences in prices on three items more than cover the $730,883 spread between first and second bids: Low bid was $367,650 and 54% under second bid on concrete bases for river piers; $225,000 and 60% under on concrete seals for river piers; $220,880 and 24% less on 14" steel bearing piles.

The completed highway bridge across the Hudson River in Ulster and Dutchess Counties will cost about $20 million. It will have a 36-ft roadway and be 7,793 ft long abutment to abutment, with continuous trusses over the river piers and plate girder construction over the land piers.

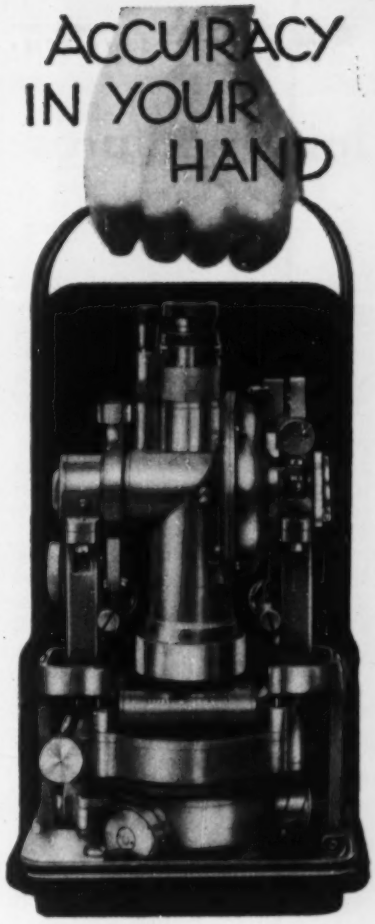
The substructure must be completed within 600 calendar days. All materials will be furnished by the contractor.

Prevailing wage rates include: pile driver operating engineers, $3.775 per hour; carpenters, $3.00 per hr; dock builders and millwrights, $3.75.

Bidders include:

1C	Merritt-Chapman & Scott Corp., New York, N. Y.	$4,495,477
2	Moore-Lopier Corp., New York, N. Y.	5,226,360
9	Baltimore Contractors, Inc., Baltimore, Md.	8,923,158

Bids: 4-20-54 Item	Unit	Quantity	Unit Prices 1C	2
Clear & grub	ls	nec	$6,000	$10,000
Excavation:				
uncl	cy	150	2.00	2.00
trench, culv & br	cy	11,200	5.50	3.00
bridge, wet	cy	11,800	4.00	6.00
Embankment in pl	cy	10,200	2.50	1.50
VCP underdrain, 6"	lf	230	2.00	2.00
WI galv drpipe, 3"	lf	300	3.00	5.00
Portland cem	bbl	86,100	4.30	4.50
Natural cem	bbl	12,500	4.50	4.50
Conc above footings abut & land piers	cy	12,900	60.00	66.00
Conc above elev +20 river piers	cy	12,700	50.00	30.00
Conc footings, abut & land piers	cy	2,600	25.00	30.00
Conc seals—riv pier	cy	15,000	10.00	25.00
Conc bases—riv pier	cy	19,350	16.00	35.00
Stone masonry:				
abut & land pier	cy	14	300.00	300.00
river piers	cy	1,300	200.00	200.00
Dimension masonry:				
abut & land pier	cy	8	500.00	500.00
river piers	cy	104	350.00	350.00
abut pylons	ea	4	1,000	1,000
Bar reinf, struct	lb	2,530,000	0.14	0.15
Str stl, grillages	lb	114,000	0.20	0.15
Str stl, pier portals & struts	lb	425,000	0.25	0.18
Misc met, piers 12 & 22	ls	nec	5,000	10,000
Misc met, pr 14-21	ls	nec	19,417	30,000
Fndn crs grav, ROB	cy	900	2.30	10.00
Membrane waterprf	sy	450	2.50	5.00
Protect crs for membr waterprf	sy	450	4.00	7.00
Cofferdams	sf	74,300	5.50	6.00
Stl bearing piles, 14"	lf	100,400	6.80	9.00
Cast in pl conc piles	lf	9,000	6.00	6.00
Furn equip for driv piles:				
on land	ls	nec	2,000	5,000
on water	ls	nec	5,000	30,000
Scrnd grav, loose meas	cy	30	6.00	10.00
Grav fill, ROB	cy	850	2.50	5.00
Electrical work	ls	nec	18,000	10,000



Carry a Kern Instrument to assure a better, faster job. Kern's consistent research and experimentation result in functional, supremely accurate instruments for you; instruments for today and tomorrow.

KERN'S DKM 2
one second Theodolite f. Triangulation, big construction and Engineering Operation.

FAST DIRECT READING
To 1", Estimation to 1/10".
All reading from 1 position.

COMPACT INSTRUMENT
is highly portable. Weight 6 lbs. Height 7" including Metal Case.

Ask for detailed Brochure DK518-1
SERVICE DEPARTMENT
FACTORY TRAINED PERSONNEL

Kern SWISS
The FINEST in SURVEYING EQUIPMENT
KERN INSTRUMENTS INC.
120 Grand St., White Plains, N.Y.

Joint ventures: more and more of them

J. P. Chamberlain
Associate Editor

The joint-venture method of handling construction work, often used in recent years by big contractors to handle huge jobs, is becoming more and more popular with small and medium-sized construction firms. Just as the biggest names in the business found it made sense to get together to bid on contracts that none had the capacity to handle alone, so smaller firms are finding that the joint-venture greatly increases the range of jobs on which they can bid.

An ENR survey of construction firms of varying sizes shows that most believe the joint venture will continue to increase in popularity. It's fairly typical for a large construction company nowadays to be doing half its work in joint ventures, whereas before World War II it might have joint-ventured 10% or less.

This is the reason: Although jobs have been getting bigger and bigger over the last 20 years, large construction firms have found that it isn't economic to build their staffs up to the point where they can handle an occasional huge job all by themselves. In fact, observers say that some quite large contractors are finding that they can earn more per dollar of invested capital by doing $20 million of business a year than by trying to be big enough to do $50 million.

Most joint ventures are created by contractors, though somewhat similar cooperation is not unknown among architects and engineers. The architect-engineer combinations which developed during the war construction program are the best known examples. Before that an engineering firm would hire an architectural firm—or vice versa. Even now it is a common practice. Or an engineering firm faced with a particular problem outside of its principal experience may call in another firm. Such arrangements cannot be considered joint ventures, however, though some architect-engineer combinations undoubtedly have used the same type of risk-sharing and ability-sharing that joint-venture contractors do.

To executives of most big construction companies, the joint venture is an old story. They know its strong points, and what its weaknesses are. For the benefit of those contractors and engineers who may be less familiar with the subject, ENR has surveyed construction companies which have joint-ventured, and has talked to executives and lawyers who know the ins and outs of this method.

• **What is it?**—To start with, what is a joint venture? It is not as simple as it sounds, for it is neither a corporation nor, strictly speaking, a partnership. Actually, it is much older than the corporation; some observers believe that prototypes of the modern joint ventures were organized to build Greek temples. A joint venture is a group of business units—usually corporations nowadays, but occasionally including partnerships or individuals—temporarily acting together to perform a specific contract. Co-venturers provide either money, management, equipment, or some combination of the three. For tax reasons, it is important that a joint venture be set up in such a manner that it cannot be taxed as an association or corporation.

What are the mechanics used? Often, leadership of the venture is taken by a "sponsor," who advances the largest capital contribution and most of the personnel. Usually, one venturer with good bank connections arranges a bank loan for the venture, secured by the credit of the whole group and by the contract. Actual operation of the job is directed by a project manager, usually a high-ranking employe of one of the co-venturers, who has been detached for this purpose. Generally, this key executive is selected when the group is formed and before the bid is made. If there is a sponsor, that sponsor usually supplies the project manager, who is responsible to a job committee composed of representatives of each co-venturer.

From a legal standpoint, it's important to note that members of this committee are representatives of their companies, not officers of the joint venture. In law, the board of directors of a corporation controls that corporation and cannot delegate its authority. So the members of the job committee are agents, representing their companies, and acting in concert.

In practice, the job committee may not meet very often; yet meetings must be frequent enough to establish and maintain mutual confidence and understanding. Very often, agreement can be secured by telephone. Once a group of firms does have that common understanding, it finds considerable advantages in the joint-venture form. Besides multiplying their individual bidding capacity, it has these additional virtues:

Advantages

• **It spreads the risk**—Even though a contractor has sufficient financial capacity to handle a job, to spread the risk he may want to have other firms share the contract with him. This is especially true if the degree of risk on the job is such that failure conceivably could wipe out a single contractor. From the viewpoint of the client, the joint venture is protection, too. A single contracting firm might fail to complete the contract through unexpected difficulties—for example, unusual ground conditions or the death of a key man. But a group is much more likely to complete the job. The members of the venture are jointly and severally responsible. This is why the federal government usually prefers that overseas defense projects be done by joint ventures.

• **It pools abilities**—On a complex job, as for example a hydro project where dam building, powerhouse construction, extensive foundation work, and earthmoving are involved, a contractor with particular experience in powerhouse construction might want to call in firms with special competence in these other fields. By forming a joint venture, instead of taking bids to subcontract the work, he eliminates the subcontractor's profit margin and thus may be able to make a lower bid.

However—and this is very important—the co-venturers must have sufficiently wide experience to be able to appreciate each other's problems. Otherwise, there can be trouble.

• **It aids estimating**—By bringing in partners who figure separate bids for the whole job, a contractor gets the benefit of independent checks on his own bid estimates. This has tremendous value, since, of course, profits depend on accuracy of cost estimates.

• **Offers investment opportunities**—For firms whose personnel and equipment already are tied up on other jobs but who have some extra capital, the joint venture provides a means of keeping their money working.

• **Will it eliminate competition?**—By inviting possible competitors to form a joint venture, a contracting firm may eliminate possible competition. But on the other hand, it is usually difficult to foresee who the competition will be. Also, the joint-venture method tends to increase competition because it becomes possible for many firms to bid a job, which otherwise would not have been able to enter the picture. That's why lawyers who are familiar with joint ventures agree that such ventures are not likely to interest the Justice Department's anti-trust division.

• **It encourages future business**—By inviting other firms to come into a joint venture, the sponsor is laying a basis for possible future business. Later, the other firms may reciprocate by inviting the original sponsor into other ventures.

How It Works

Here, for example, is the story of how one not necessarily typical joint venture started. The City of Toronto, Ont., had drawn up plans in the spring of 1949 for a subway. One of the firms that heard about this project was a New York City company. The Arthur A. Johnson Corp., which had had considerable experience with building subways.

By a series of phone calls and meetings, Johnson formed a joint venture with B. Perini & Sons, a firm whose headquarters is near Boston; Johnson, Drake & Piper, Inc., of New York, and Charles A. Pitts, General Contractor, Ltd. of Toronto. Their object: to bid on a section of the subway.

• **Logical lineup**—The logic of this lineup was quite simple. The Johnson corporation knew Perini, and Johnson, Drake & Piper well. In fact, it had bid with both other outfits at different times on previous jobs, though neither group had won a contract. The Toronto firm, Pitts, would be able to provide valuable local information.

Both Perini and JD&P were experienced in a wide variety of work, but it was decided that the Johnson corporation should be the sponsor for this venture because of its subway experience. In April 1949, Dick Johnson, executive vice-president, and Charles Molineaux, chief engineer of the Johnson corporation, went to Toronto and looked over the plans.

What a joint venture does

- **Increases bidding capacity**
- **Spreads the risk**
- **Pools abilities**
- **Provides check on estimates**
- **Encourages future business**
- **Keeps money working**

They studied the site and talked with the engineers of the Toronto Transportation Commission. In the discussion of local conditions, Pitts (the Toronto member) was asked to forward local prices on material, labor wage scales and conditions, and so on, to the other venturers to help in preparation of bids.

Early in May, representatives of all the members met in the Johnson office, then in Long Island City, to arrive at a uniform basis for making bids. Having looked over the site, and examined the plans they were in a position to estimate the amount of capital needed to carry out the contract, and tentatively decided what percentage each member would take. How this job was decided is not known, but it is typical for the sponsor of a venture to be allowed a larger share because he provides the principal part of the staff.

Next, each co-venturer figured the bid separately. This took about six weeks. On June 21, 1949—the day before bids were to be submitted in Toronto—the second pre-bidding meeting was held. The members ironed out differences in their bids, and decided what they would put in for profit margin. Then they signed a joint-venture agreement and submitted their bid.

• **Low bidder**—A few days later, the group got the news. It was low bidder. There had been seven other bidders, not all of them joint ventures, and including U. S., Canadian, and English firms.

Representatives of the group went to Toronto. The client, the Toronto Transportation Commission, asked a few questions about the bid to make sure that both sides understood each other. A name for the venture was decided on, putting the Canadian contractor first: Pitts, Johnson, Drake & Perini. On July 7, each venturer went to Toronto to sign the contract in the board room of the TTC building.

Work started about August 1, 1949, and was finished at the end of March 1954. The job committee in charge of the venture was headed by Dick Johnson. It met only two or three times during this period of almost five years.

Formal votes were unusual. As Charles Molineaux, who was project manager on the job, says:

"Business is not done on the basis of a majority vote. We always try for unanimity. If one of the other members should want to change anything that was being done, he could talk to Dick Johnson. Johnson might or might not pass it along to me. So I do not know whether anyone ever did request changes."

However, the joint venture is no universal panacea. **Edgar Spencer**, a New York lawyer who has spent more than 30 years drawing up joint-venture agreements says: "A joint venture is like a suit of clothes; you must cut it to fit the circumstances."

• **Three types**—This lawyer outlines two general types of joint ventures:

(1) The informal "joint-account" venture, made up by a series of telephone calls among friends, and confirmed by casual contacts. Degrees of familiarity vary. In a group of four co-venturers, the sponsor may know all the other companies well, another may know two others, and still another may be familiar only with the sponsor. So the informal joint venture shades into:

(2) The formal joint venture, which provides elaborate clauses as to the powers of the job committee, who is to be project manager, and careful provisions as to when and how the venturers must put up their capital. There are severe penalties for failure to put up capital on time, since delay by one venturer may injure the others.

In some cases, the venturers may decide to forego the tax advantage of a joint venture, and form a corporation to do the job. Although it is true that joint ventures are used to spread the risk on a job, sometimes contractors believe that the method itself is too risky. If there is a loss, each member must pay his percentage, no matter how big the loss is. On some jobs, this conceivably could amount to more than his original investment. Had the co-venturers formed a corporation to do the job, their losses would be limited to their original investment, unless their other resources were pledged under a performance bond.

(*Continued on page 127*)

THE LONGER LOOK:

General business outlook: not much change for the rest of this year. Can construction activity keep moving up?

Since spring began, the business decline that hit nearly every sector of the economy last summer and fall has been leveling off. For the rest of the year we may see the same pattern continuing: little change in business conditions, up or down.

However, construction so far has been one of the brightest spots in the economic picture. Industrial production dropped 10% from the peak reached last July before settling at 123 (1947-49 = 100) in March. Between August and March, however, the estimated value of new construction put in place rose 10% (chart). Whether construction put in place can continue climbing to new heights, despite the falling off in general business activity, is one of the biggest question marks for the coming six months.

• **Bright side**—Construction in place has been exceeding the optimistic forecasts made last fall. Big spurts in commercial, education, religious, highway and sewer and water construction, accompanied by surprising strength in private residential construction, have pushed the dollar volume for the first four months of 1954 ahead of the same period last year.

New peaks being set in contract awards reported by ENGINEERING NEWS-RECORD are among the hopeful signs that the fast pace of construction will not slacken in the near future. After a winter lull in awards, April and May figures picked up sharply. May, in fact, set a new record for that month (ENR June 10, p. 103). These awards should be showing up shortly in actual work statistics.

• **Dark side**—On the darker side, an additional drop in industrial construction and increasing difficulty in selling new houses could put a drag on building activity if consumer income and business sales continue at present lower levels or decline further. Also, the seasonal adjustments used in government construction statistics have made the early months of the last few years look better than the entire year justified. There may be an opposite tendency to make the latter part of this year look worse than it really is.

The recent survey of business plans for new plants and equipment made by the McGRAW-HILL DEPARTMENT OF ECONOMICS revealed heartening confidence in the future on the part of industry. Plans reported indicate expenditures by manufacturing companies of about the same amount this year as in the record year 1953. But a shift in favor of modernization, rather than expansion of facilities, indicates that relatively less will go to steel and cement. Completion of major expansion programs in utilities and other industries could mean lighter demand for industrial construction before the end of the year.

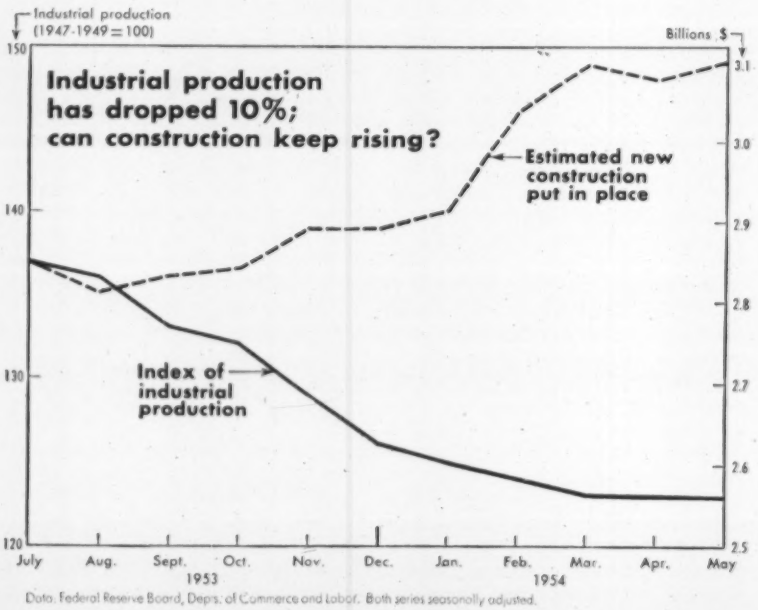
• **Downward, gently**—General business activity promises to continue its gentle downward drift into the third and possibly into the final quarter of the year. Gross national product, the measure of total output of goods and services, slipped from an annual rate of $371.4 billion last spring to $357.8 billion the first quarter of this year. By the end of the year, it may be down to a rate of $350 billion, barring a drastic increase meanwhile in military spending.

Although personal income has dropped about 2 per cent since last summer, tax reductions have held disposable personal income—which determines consumer spending power—at last fall's record level. High dividend payments, unemployment compensation and increased social security benefits should offset largely the expected additional drops in wage and salary income.

Two leading features of the current business decline are the substantial drop in federal spending and adjustment of business inventories. Early this year federal purchases of goods and services were about $5 billion lower, on an annual rate, than last spring. Reduction of business inventories has been proceeding gradually since last fall, which means that more goods are being consumed than are being produced currently. A decline in sales, however, has dampened the effect that inventory reduction otherwise would have had on new orders.

• **Fast change possible**—The course of business could change fairly fast with a shift in the consumer's spending and saving pattern or in the trend of federal spending. A major military effort in Indo-China, for instance, could set off a big increase in defense and consumer spending. If the rate at which consumers save their income were to drop from the present level (8 per cent) to that prevailing in 1949 (3.6 per cent), the increased spending could easily take up the slack in the economy.

A summer pickup in business does not now seem to be in the cards. On the other hand, don't let the seasonal rise in unemployment in June and July worry you. School graduates and summer work-seekers will boost the total. This rise in unemployment should correct itself by fall.



Data: Federal Reserve Board, Depts. of Commerce and Labor. Both series seasonally adjusted.

(Continued from page 125)

If there is a corporation, it pays regular income tax on its profits. Then 15% of the dividends it passes on to its parent companies are again taxable to them. These dividends would be the same as profits after taxes, since presumably the corporation would be dissolved when the job was finished. On the other hand, profits of a joint venture go to the member companies without a preliminary tax bite.

• **Precautions**—That is why tax lawyers are careful to set up joint ventures in such a way that the Internal Revenue Bureau cannot claim they are taxable associations or corporations. To make sure that your joint venture is not classed as a corporation, you:

• Provide in your agreement for specific advances of money, personnel, equipment, or materials.

• Give the joint venture no independent authority to conduct its own affairs.

• Specify that the members of the job committee are serving as representatives of their own companies, not as officers of the joint venture.

May housing starts are 106,000, 4% below April

Housing starts for May were 106,000, according to the Bureau of Labor Statistics. This is a 4% decline below April. Private starts were down 3%, and public units were down 44%.

Though private starts were lower than in April, the 105,500 units begun in May were only a hairline under the total for May 1953. For the first five months of this year, total private units started are 447,000. That is only 1% below 1953's first five months. Also, it is the third best showing on record for the first five months of the year.

Public housing units started in May were only 500, bringing the five-month total to only 5,100. This is 80% below the 25,100 begun in the same 1953 period. It is also the smallest number of public-owned units started in the first five months of any year since the new program was begun with the passage of the Housing Act of 1949.

Two small steel producers cut structural prices

Two small steel producers in eastern Pennsylvania have cut prices on structural steel. The cut: $7 on wide flange and standard shapes. That brings the price on structurals down to $76 a ton. The price of carbon steel plates also has been cut by $5 a ton to $77.

The two companies are Central Iron & Steel Co., of Harrisburg, and Phoenix Iron & Steel Co., of Phoenixville. Both are subsidiaries of Barium Steel Corp., New York.

This brings the price down several dollars a ton below that quoted by larger companies. But the big firms say that they have no plans to cut prices.

Business briefs . . .

• **Competition in California** on building work is pointed up in a report by the State Architect, Anson Boyd. He says that bids on state building jobs averaged 5.02 per project during the first quarter of 1952, 5.88 bids per project in the first quarter of 1953, and 6.60 bids per project in the first quarter of this year.

• **Levitt prices cut**—Levitt & Sons, Inc., has cut the price of its two-bedroom, ranch-type home in Levittown, Pa., by $510. The new price is $8,990; it was $9,500. No change has been made in the price of the four-bedroom house.

• **New Jersey toll roads**—The New Jersey State Highway Authority plans to sell between $30 million and $50 million of new revenue bonds to complete the Garden State Parkway and build a connecting link with the New York State Thruway.

• **Wellman Engineering Co.**, of Cleveland, has acquired the locomotive crane division of Browning Crane & Shovel Co., also of Cleveland. Wellman makes a wide variety of heavy materials handling equipment. Browning will continue to make its truck and wagon cranes.

• **Florida** has just sold $30 million in school revenue bonds, secured by auto registration fees. The state rejected a bid of 2.96% by an investment banking syndicate, and decided to sell the issue to state pension funds at 2.75%. This financing is part of a $100-million school construction program.

• **Carrier Corp.** Plans to expand its production of room air conditioners by 75% by expanding its Syracuse, N. Y., plant.

• **Control of U. S. Lift Slab changes**—John P. Hall, investment banker of Austin, Tex., has acquired controlling interest in U.S. Lift Slab Corp., formed last year to develop through licenses the Youtz-Slick lift-slab method of construction.

Activity This Week

As reported to ENR
(In millions of dollars)

Amount of contracts let

	This Week	Cumulative 24 wks 1954	1953	% chge
Federal	$35.1	$519.7	$720.0	−28
State and municipal	111.0	2,100.3	2,240.9	−6
Total pub.	146.1	2,620.0	2,960.9	−12
Total priv.	171.8	3,570.7	4,210.6	−15
U. S. total	**$317.9**	**$6,190.7**	**$7,171.5**	**−14**
Contracts by type of work				
Waterworks	$2.5	$105.9	$115.7	−8
Sewerage	9.8	171.6	179.9	−5
Bridges	16.8	184.5	271.0	−32
Highways	36.9	764.9	764.3	0
Earthwork, waterways	8.4	131.7	175.7	−25
Buildings:				
Public, excl. hsg.	42.7	776.4	810.8	−4
Housg., Pub.	5.1	91.1	257.5	−65
Housg., priv.	92.1	1,971.4	1,897.0	+4
Commercial	42.7	583.4	513.7	+15
Industrial	29.2	875.1	1,409.7	−38
Unclassified	31.7	534.7	776.2	−31
Total	**$317.9**	**$6,190.7**	**$7,171.5**	**−14**

NOTE: Minimum size projects included are: Waterworks and waterway projects, $34,000; other public works, $60,000; industrial buildings, $82,000; other buildings, $300,000.

New capital for construction

(millions of dollars)	Week of June 10 1954	Cumulative 23 Wks 1954	% chge 1953-54
Corporate securities	$53.4	$1,369.5	−39
State and municipal:			
All except housing	111.6	2,521.1	+38
Housing	...	42.6	−79
Federal loans	...	53.2	+4
Federal aid	...	55.0	...
Total non-federal	**$165.1**	**$4,041.5**	**1**
Federal approps.:			
In U. S.	...	56.0	...
Outside U. S.	...	4.6	...
Total new capital	**$165.1**	**$4,102.1**	**+2**

ENR indexes		Base years = 100 1913	1926	1949
Constr. cost	June '54	622.49	299.23	136.50
	May '54	618.69	297.40	129.70
Bldg. cost	June '54	440.12	237.92	125.11
	May '54	438.69	237.14	124.70
Volume	May '54	648	263	187
	April 54	517	210	149

it takes two

DISPLAY ADVERTISING

- AROUSES INTEREST
- CREATES PREFERENCE

DIRECT MAIL

- GETS PERSONAL ATTENTION
- TRIGGERS ACTION.

After your prospect has been convinced by DISPLAY ADVERTISING, he still must take one giant step. *He must act.* A personalized mailing piece direct to his desk, in conjunction with a display campaign, is a powerful action getter.

McGraw-Hill has a Direct Mail Division ready to serve you with over 150 specialized lists in the Industrial Field.

To get your copy of our free INDUSTRIAL DIRECT MAIL CATALOGUE (1954) containing complete, detailed information about our services, fill in the coupon below and mail it to McGraw-Hill.

Do it now! The best advertising programs are planned well in advance.

Direct Mail Division,
McGraw-Hill Publishing Co., Inc.
330 West 42nd St., N. Y. 36, N. Y.

Please forward my free copy of the McGraw-Hill "Industrial Direct Mail Catalogue."

NAME_____

COMPANY_____

ADDRESS_____

CITY_____ STATE_____

NOTICE TO BIDDERS

SEALED BIDS will be received jointly by the Parish of Jefferson and the Parish of St. Tammany, State of Louisiana, at the Office of the Secretary of the Jefferson Parish Police Jury, in the Courthouse at Gretna Louisiana, until two (2:00) o'clock P. M., Central Standard Time, June 23, 1954, and immediately thereafter publicly opened and read, for the furnishing of all plant, labor, equipment, materials and other facilities, and all other things necessary and proper for and incidental to the construction of

(a) GREATER NEW ORLEANS EXPRESSWAY—Lake Pontchartrain Bridge, from Station 298 + 90 to Station 1570 + 68.5 including the substructures, superstructures, movable bascule spans, administration buildings, garages, toll booths, toll equipment, plazas, and all appurtenances; as described in plans and specifications prepared by Palmer and Baker, Inc., Consulting Engineers, and hereinafter referred to as Contract 65.

(b) GREATER NEW ORLEANS EXPRESSWAY—The Approaches—South Shore, Harlem Avenue—from Station 143 + 00 to Station 292 + 55.99, in Jefferson Parish, Louisiana, including bridges, drainage structures and ditches, and other improvements; as described in plans and specifications prepared by Palmer and Baker, Inc., Consulting Engineers, and hereinafter referred to as Contract 65-1.

(c) GREATER NEW ORLEANS EXPRESSWAY—The Approaches—North Shore—from Station 1570 + 68.5 to Stations 1664 + 23, 1714 + 72.87, and 117 + 08.95, to the east, north and west, respectively, in St. Tammany Parish, Louisiana, including bridges, drainage structures and ditches, and other improvements; as described in plans and specifications prepared by Palmer and Baker, Inc., Consulting Engineers, and hereinafter referred to as Contract 65-2.

Bids will be received only on all three foregoing items, namely, Contracts 65, 65-1 and 65-2, in combination. Bids on individual contracts or on any combination of two contracts will not be considered.

Plans and specifications may be examined at the aforesaid Office of the Secretary of the Jefferson Parish Police Jury, and also at the Office of the Secretary of the St. Tammany Parish Police Jury, in the Courthouse at Covington, Louisiana, and said plans and specifications may be examined and information obtained from Palmer and Baker, Inc., Room 427, National Bank of Commerce Building, New Orleans, La., or 957 Spring Hill Avenue, Mobile, Ala., (Post Office Box 346). Complete copies of the foregoing documents will be furnished to bona fide bidders upon a deposit of $250.00 per set for item (a), Contract 65; $100.00 per set for item (b), Contract 65-1; and $100.00 **per set for item (c), Contract 65-2; respectively.** The deposits, if a bid is made, will be remitted not later than thirty (30) days after the opening of bids, provided the documents are returned complete and in good condition.

Certified checks on a National Bank or a Louisiana State Bank in good standing and drawn to the order of "The Parish of Jefferson and the Parish of St. Tammany" in the following amounts must accompany each bid as a guarantee that the bidder, if successful, will enter into contract and make bond in accordance with the requirements of the specifications:

For item (a), Contract 65—$1,500,000.00;

For item (b), Contract 65-1—not less than five per cent (5%) of the total amount bid therefor; and

For item (c), Contract 65-2—not less than five per cent (5%) of the total amount bid therefor.

Bidder's bonds, Cashier's checks or currency will not be acceptable.

Attention is called to the fact that after bids are received hereunder revenue bonds will be offered for sale by said Parishes to finance the cost of the work, that the award of the work herein advertised will be contingent upon the sale and delivery of said revenue bonds, and that the obligations of said Parishes under the contracts thus awarded will be payable solely from the funds derived from the issuance and sale of such revenue bonds.

All bids shall be submitted in sealed envelopes bearing on the outside the name of the bidder, his address, and the designation of the work, "Greater New Orleans Expressway." If submitted by mail, the sealed envelope containing the bid, and marked as directed, shall be enclosed in another envelope addressed to:

Honorable Frank J. Deemer, Secretary, Jefferson Parish Police Jury.

and

Honorable L. L. Landon, Secretary, St. Tammany Parish Police Jury,
Post Office Box No. 109, Gretna, Louisiana.

The Parish of Jefferson and the Parish of St. Tammany reserve the right to reject any and all bids to waive informalities in any bid.

All bids will be retained by the Parish of Jefferson and the Parish of St. Tammany and none will be returned. No bids received later than the time specified for submission will be considered.

The Police Jury of the Parish of Jefferson and the Police Jury of the Parish of St. Tammany will meet in the Police Jury Room of the Courthouse at Gretna, Louisiana, on the date and at the time first hereinabove shown, and will then and there proceed to open and read said bids in joint public session.

For the
PARISH OF JEFFERSON, LOUISIANA

(s) FRANK J. DEEMER,
Secretary, Police Jury

For the
PARISH OF ST. TAMMANY, LOUISIANA

(s) L. L. LANDON,
Secretary, Police Jury

OFFICIAL PROPOSALS

RATE: The rate for Official Proposal advertising is $1.80 per line or fraction set solid. Where the advertisement is set other than solid, the space is measured by total space occupied and charged on basis of 12 lines to the inch.

CLOSING DATE: Friday 10:30 A.M. for issue dated the following Thursday.

SEND COPY TO: Official Proposal Division, Engineering News-Record, 330 West 42nd Street, New York 36, N. Y.

Bids: July 1, 1954

New York State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.,—Pursuant to the provisions of the Highway Law, Public Buildings Law, and Article 2, Title 9 of the Public Authorities Law, and special provisions for projects financed with Federal Aid Funds, sealed proposals will be received until ten-thirty o'clock A.M., advanced standard time, which is nine-thirty o'clock A.M., eastern standard time, on the 1st day of July 1954, by Henry A. Cohen, Director, Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects:

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
DISTRICT No. 1, N. F. Ronan, Acting District Engineer, 353 Broadway, Albany, N. Y.						
Essex	FARC 54-73	Ticonderoga-Montcalm Landing, S. H. 8073 Proj. F-371(4)	2.33	Asp. Conc. Opt.	$13,000 Plans $10	$243,000.00
Essex	FARC 54-74	Whallonsburg-Essex, S. H. 8063 Essex-Willsboro, Pt. 1, S. H. 8128 Proj. F-4 7(8)	7.67	Asp. Conc. Opt.	$30,000 Plans $15	566,000.00
Saratoga	FARC 54-8	Schenectady County Line-Scotch Church, S. H. 1706 Scotch Church-Galway-Kimballs Corners, S. H. 1851 Proj. S-758(3)	8.27	Asp. Conc. Opt.	$30,000 Plans $25	530,000.00
DISTRICT No. 2, L. Ketchum, District Engineer, 109 No. Genesee Street, Utica, N. Y.						
Herkimer	M 54-3	Lock 17-E Little Falls (Barge Canal)	....	Installing New Upper Lock Gate & Relining Gate Recess	$7,300 Plans $10	133,234.50
Herkimer	M 54-4	Lock 17-E Little Falls (Barge Canal)	0.16	Construction of Lower Guide Wall	$33,000 Plans $10	592,607.00
Madison and Oneida	M.T. 54-2	New York State Thruway—Mohawk Section—Subs. 1, 2, 3, 4, 5—(Onondaga-Madison Co. Line to 4± Miles West of Westmoreland Interchange)	24.10.	Erection of 2.09 Miles of Cattle Fence at Various Locations	$900 Plans $10	15,000.00
Madison	M.T. 54-3	New York State Thruway—Mohawk Section+ Sub. 2 (Canastota Gas Station-Restaurant Site, Type B)	....	Grading, Paving and Misc. Work	$9,000 Plans $10	161,000.00
DISTRICT No. 3, William Robinson, District Engineer, Weigh Lock Building, Syracuse, N. Y.						
Tompkins, Cortland, and Tioga	FARC 54-77	Dryden-Harford, S. H. 8016; Harford Mills-Dryden, Pt. 1, S. H. 1075; Harford, S. H. 379 and Richford-Harford Mills, S. H. 1452 Proj. S-63(3); F-427(8)	9.58	Asp. Conc. Opt.	$47,000 Plans $15	845,000.00
Seneca	FASSH 54-12	S. H. No. 273-Magee Proj. S-8G-284(3) Cont. #1	3.85	9" Cem. Conc. Pavt. 24' Wide	$35,000 Plans $10	603,000.00
DISTRICT No. 5, C. R. Waters, District Engineer, 65 Court Street, Buffalo, N. Y.						
Cattaraugus and Erie	FASSH 54-13 FARC 54-76	Ellicottville-Springville, Pts. 2 & 3 Springville Village, S. H. 989 Hamburg-Springville, S. H. 528 Proj. S-365(2); S-369(2)	10.07	Asp. Conc. Opt. = 10.05 Mi. Misc. Work = 0.02 Mi. 2 Closed Box Brs. 24' & 24' 1 Cont. Deck Truss Br. 650'	$147,000 Plans $50	2,690,000.00
Chautauqua	FARC 54-75	Sinclairville-Cassadaga, Pts. 1 & 2, S. H. 1012-1012A-8108 Pratt Corner-Sinclairville, S. H. 1471 Proj. S-796(3)	6.84	9" Two Course Cem. Conc. Pavt. 24' Wide = 6.20 Mi. Asp. Conc. Opt. = 0.60 Mi. Misc. Work = 0.04 Mi. 1-Comp. I-Beam Br. 110.5' 1-Comp. I-Beam Hy. Sep. 123.7' 1-Conc. Slab Br. 24' 1-I-Beam Br. 33'	$90,000 Plans $25	1,600,000.00
Erie	FASS 54-11	Harlem Avenue C. R. 210 Proj. S-353(1)	0.21	Asp. Conc. Opt. = 0.20 Mi. Misc. Work = 0.01 Mi. Widening Exist. 259.4' Deck Girder	$17,000 Plans $10	309,000.00
DISTRICT No. 6, J. H. Thomas, District Engineer, State Office Building, Hornell, N. Y.						
Chemung and Tioga	R.C. 54-72	Br. No. 1, S. H. 8471; Br. No. 1A, S. H. 8215 and Br. No. 1, S. H. 1932	....	Cleaning & Painting 3 Bridges	$1,400 Plans $10	25,000.00
DISTRICT No. 7, R. W. Sweet, District Engineer, 444 Van Duzee Street, Watertown, N. Y.						
Franklin, Jefferson, Lewis and St. Lawrence	R.C. 54-71	Br. No. 1, S. H. 5468; Br. No. 1, S. H. 428; Br. No. 1, S. H. 1165; Br. No. 1, S. H. 5332A; Br. No. 1, S. H. 1192; Br. No. 1, S. H. 735; Br. No. 2, S. H. 5509	....	Cleaning & Painting 7 Bridges	$1,400 Plans $10	24,000.00
DISTRICT No. 8, J. S. Bixby, District Engineer, Pleasant Valley Road, Poughkeepsie, N. Y.						
Westchester	R.C. 54-70	Tarrytown-White Plains Pt. 1, S. H. 503	0.01	Reconstruction of Culvert & Misc. Work	$300 Plans $10	5,000.00
Westchester	WS #2-W	Access Road to Weighing Station No. 2 Adjacent to Port Chester Village, S. H. 5719	0.10	Asp. Conc. Opt. & Misc. Work	$1,000 Plans $10	19,000.00
DISTRICT No. 10, M. E. Goul, District Engineer, Montauk Highway at Little East Neck Road, Babylon, L. I., N. Y.						
Bronx	N.E.T. 54-1	New York State Thruway—New England Section (Cont. 1A Demolition)	2.33	Demolition of Buildings	$700 Plans $10	12,000.00
Bronx	FAMDE 54-5	Major Deegan Expressway Extension Cont. 5A Proj. UI-1082(17)	(1.0 Hwy.) (3.12 Acc.)	9" Cem. Conc. Pavt. 2 @ 36' Var. Wid = 2.28 Mi. Sheet Asph. = 1.44 Mi. Asp. Conc. Opt. = 0.33 Mi. Granite Block = 0.07 Mi. Hy. Sep. Comp. I-Beam 160' Hy. Sep. Rigid Frame 44.3'	$180,000 Plans $50	3,182,000.00

Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts and Accounts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for Plans and Proposal Forms for each contract is indicated above. A refund will be made in full to bidders for return of one set, in good condition, within 30 days of award, or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Special attention of bidders is called to "General Information for Bidders" in the proposal, specification, and contract agreement, and to the special provisions applying to projects financed with federal funds. Award of contract is subject to priorities and allocations under the Defense Production Act of 1950, as amended, and all regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Laws, as set forth in "Instructions to Bidders."

When optional types are permitted on contracts with federal funds, bidders must state in the space provided in the proposal the exact designation of the optional type upon which the proposal is predicated. The right is reserved to reject any or all bids.

B. D. TALLAMY
SUPT. OF PUBLIC WORKS

OFFICIAL PROPOSALS

Bids: June 29, 1954

Paving and Drainage Improvements

THE PORT OF NEW YORK AUTHORITY
NEW YORK INTERNATIONAL AIRPORT
CONTRACT O & M 253
PROPOSAL NO. 456

Sealed proposals for furnishing all labor, material and equipment necessary for paving and drainage improvements at New York International Airport, Jamaica, N. Y., will be received at the office of the Department of Purchase and Administrative Services, The Port of New York Authority, Room 900, 111-8th Ave., New York 11, until 11:00 A.M. (D.S.T.) Tuesday, June 29, 1954, at which time and place said proposals will be publicly opened and read.

Contract documents may be seen at the office of the Department of Purchase and Administrative Services, The Port of New York Authority, 111-8th Ave., New York 11, and copies will be furnished upon deposit of $10.00 per set. Deposit must be delivered to the Treasury Department, Room 719, where a receipt in duplicate will be issued. The duplicate copy of the receipt is then to be delivered to the Department of Purchase and Administrative Services, Room 900, 111-8th Ave., New York 11, and you will be furnished with the contract documents. The deposit will be refunded if the documents are returned in good condition, not later than thirty days after the opening of proposals. The deposit will be forfeited if the documents are not returned within thirty days.

THE PORT OF NEW YORK AUTHORITY
Howard S. Cullman, Chairman

Bids: July 19, 1954

Sewage Treatment Plant

NOTICE TO CONTRACTORS

Sealed proposals will be received by the Borough of Red Bank, New Jersey, until 8:30 P.M. Eastern Daylight Saving Time, on Monday, July 19, 1954, at the Borough Hall, 51 Monmouth Street, Red Bank, New Jersey, at which time and place the bids will be publicly opened and read aloud for the furnishing of all plant, labor and material and performing all work for the construction of additions and alterations to the Sewage Treatment Plant for the Borough of Red Bank.

The project includes the construction of a grit removal unit, comminutor, primary settling tanks, two (2) separate sludge digestors, control building, chlorine building and appurtenances, the conversion of the existing settling tank to a chlorine detention unit and all other work required in strict accordance with the plans and specifications.

Plans, specifications, and proposal forms may be obtained at the offices of the Consulting Engineer, A. J. Lanning, 1100 South Broad Street, Trenton 10, New Jersey, upon a deposit of $50.00 for each set of documents. The "Form of Proposal" attached to the specifications obtained from the Engineer, must be used when the bid is submitted. If the documents are returned in good condition within ten (10) days after the opening of bids, $25.00 of the deposit for each set will be refunded. In the event that documents are not returned within the time stated, the entire amount of the deposit will be forfeited.

A certified check or a bid bond equal to 5% of the amount of the bid must be submitted with the proposal as bid security.

The successful bidder will be required to furnish a satisfactory performance bond in the sum of the full amount of the contract. No bid may be withdrawn for sixty (60) days after the closing time for receipt of bids. All proposals must be sealed and properly marked designating the contract bid upon.

Bids should be addressed to Amy E. Shinn, Borough Clerk, Borough of Red Bank, New Jersey.

The Borough of Red Bank reserves the right to reject any or all proposals and to waive all informalities and irregularities in the bids received, and to accept any proposal which is deemed most favorable to the Borough of Red Bank.

By order of the Mayor and Council
Borough of Red Bank.
Amy E. Shinn, Borough Clerk

OFFICIAL PROPOSALS

Bids: June 29, 1954

Contract No. 41

WEST VIRGINIA TURNPIKE
COMMISSION

ADVERTISEMENT FOR PROPOSALS

Sealed proposals will be received by the West Virginia Turnpike Commission for:

The work to be done under this Contract consists of furnishing and erecting side-of-road delineators complete on steel posts or brackets for approximately 88 miles of the West Virginia Turnpike.

This work is located between Princeton, Mile 0, and Charleston, Mile 88, in Mercer, Raleigh, Fayette and Kanawha Counties, West Virginia, and is in connection with the construction of the West Virginia Turnpike in the State of West Virginia.

The Principal items of work include approximately 7,300 side-of-road delineators.

Alternate proposals will be received on four types of delineators as follows:

Button type with Stimsonite Buttons.
Button type with Grotelite Buttons.
Sheat type with Reflexite Sheating.
Sheat type with Grotolite Sheating.

All bidders may submit proposals on any or all types listed in the proposal.

Proposals will be received at the office of the West Virginia Turnpike Commission, Administration Building, Reed, West Virginia until 1:00 p.m. Eastern Standard Time and thereafter at the House of Delegates Chamber, State Capitol, Charleston, West Virginia, until 2:00 p.m. Eastern Standard Time, on June 29, 1954, at which time and place said proposals will be publicly opened and read.

WEST VIRGINIA TURNPIKE
COMMISSION
D. Holmes Morton
Chairman

U. S. Government

Bureau of Reclamation, North Platte River District 6254-P10, Casper, Wyoming. For Immediate Release, June 2, 1954, UNITED STATES DEPARTMENT OF THE INTERIOR, BUREAU OF RECLAMATION. NOTICE IS HEREBY GIVEN that sealed bids on Specifications No. 703C-344 for furnishing labor and materials and performing all work for CONSTRUCTING FOUNDATIONS, ERECTING STRUCTURAL STEEL AND PLACING ELECTRICAL EQUIPMENT FOR GERING SUBSTATION ADDITIONS, Transmission Division, Nebraska, Missouri River Basin Project, will be mailed to Box 280, Casper, Wyoming or delivered to the office of the Bureau of Reclamation in time for the public bid opening at 10:30 a.m., Mountain Standard Time, July 8, 1954, at the office of the Bureau of Reclamation, Reclamation Center, Casper, Wyoming. Copies of the standard forms and of the specifications may be obtained from the following offices of the Bureau of Reclamation: R. J. Walter, Jr., Regional Director, Building No. 46, Denver Federal Center, Denver, Colorado; and I. J. Matthews, District Manager, Box 280, Casper, Wyoming. No charge for copies of the specifications and drawings furnished for bidding purposes; for all others $1.75 per copy, not returnable. Payments should be made by check or money order payable to the Treasurer of the United States. I. J. Matthews, District Manager.

Department of Commerce, Bureau of Public Roads, June 1, 1954, SEALED BIDS will be received at the office of the Division Engineer, Bureau of Public Roads, 1440 Columbia Pike, Arlington, Virginia, until 11:00 a.m., D.S.T., JUNE 29, 1954, for Project 2G1, Blue Ridge Parkway, Watauga County, North Carolina. 2.778 miles. Grading, draining, crushed gravel or crushed stone base course and other work, from Route US 321 to near Sandy Flat Gap. The approximate quantities of the more important items are: 240,900 cu.yd. excavation and 35,000 tons crushed gravel or crushed stone base course. Minimum wage rates have been fixed as required by law. Plans, specifications, and proposal forms are available upon request at the address given above or Bureau of Public Roads, 920 South Jefferson Street, Roanoke, Virginia. H. J. Spelman, Division Engineer.

OFFICIAL PROPOSALS

Bids: June 29, 1954

State of New Jersey
State Highway Department
Trenton

NOTICE IS HEREBY GIVEN that sealed bids will be received by the State Highway Department for:

BRIDGETON-JERICHO ROAD

Construction of Bridgeton-Jericho Road from Central Railroad of N. J. tracks to Randolph Road, Hopewell Township, Cumberland County, Federal Aid Secondary Project No. S-176(3). Length 1.847 miles. The principal items of construction are:

Estimated:
6,692 cu. yds. Roadway Excavation
13,272 sq. yds. 10" Gravel Shoulders
25,783 sq. yds. 8" Gravel Base
2,908 tons Bituminous Concrete

Bids for the above will be received at the office of the State Highway Department, Assembly Room, Room 140, in the State Highway Office Building, 1035 Parkway Avenue, Trenton, New Jersey, on Tuesday, June 29, 1954, at ten o'clock (10:00 A.M.—EASTERN STANDARD TIME), eleven o'clock (11:00 A.M.—DAYLIGHT SAVING TIME), and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the proper qualification of the bidder in accordance with the provisions of the prequalification law and the regulations adopted by the State Highway Commissioner. Bidders must also submit a revised financial statement and statement of plant and equipment with their bid.

NOTE: The proposed project is a "Federal Aid Secondary Project" authorized by the provisions of Title 27 of the Revised Statutes of New Jersey and supplements and by P. L. 769, 81st Congress, and is to be performed in accordance with the special provisions and requirements of the Bureau of Public Roads, Department of Commerce, as outlined in the specifications, which provisions require that labor be employed from lists furnished by the State Employment Service, 22 Washington Street, Bridgeton, New Jersey. The attention of bidders is directed to the special provisions covering subletting or assigning the contract. The minimum wage paid to all common labor employed on this contract shall be $0.75 per hour. The minimum wage paid to all intermediate grade of labor employed on this contract shall be $1.00 per hour. The minimum wage paid to all skilled labor employed on this contract shall be $1.50 per hour.

Drawings, specifications and form of bid, contract and bond for the proposed work are on file in the office of the State Highway Department, Trenton, New Jersey, and may be inspected by prospective bidders during office hours. Plans will be furnished on a deposit of Ten Dollars ($10.00) for each set of plans upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 139, State Highway Office Building, 1035 Parkway Avenue, Trenton, N. J. Bids must be made upon the standard proposal forms in the manner designated in the standard State Highway specifications and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and work bid upon on the outside, and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten percent (10%) of the amount of the bid, provided that the said certified check shall not be less than $500.00 nor more than $20,000.00 and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and special addressed envelopes will be furnished on application. Bids not enclosed in sealed special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed:
STATE HIGHWAY DEPARTMENT
A. Lee Grover, Chief Clerk

U. S. Government

St. Paul District, Corps of Engineers, U. S. Army, 1217 U. S. Post Office and Custom House, St. Paul 1, Minnesota—Sealed bids will be received at this office until 2:00 P.M., C.S.T., 24 June 1954, and then publicly opened for Repairs to Access Road and Esplanade at Locks and Dam No. 2, Mississippi River, Hastings, Minnesota.

OFFICIAL PROPOSALS

Bids: July 7, 1954

Contract C-23

OHIO TURNPIKE COMMISSION
139 East Gay Street
Columbus 15, Ohio
NOTICE TO BIDDERS

Sealed proposals will be received by the Ohio Turnpike Commission at or before 10:00 A.M., Eastern Standard Time, July 7, 1954, for the performance of Contract C-23.

The work covered by the Contract consists generally of the construction of grading, drainage, structures and paving of approximately 4.0 miles in Construction Section 23 of Ohio Turnpike Project No. 1, beginning at a point about 689 feet west of State Route No. 57 at Turnpike Centerline Station 659+00 in Lorain County and extending eastwardly to a point about 4,680 feet southeast of U. S. Route No. 20 at Turnpike Centerline Station 865+00 in Lorain County, and the construction of an Engineer's office building and facilities on or near the site of the work.

The principal structures to be built are two reinforced concrete box culverts, five single bridges and seven twin bridges (each twin bridge consisting of two separate but nearly identical and parallel structures). Ten of the bridges are steel beam bridges of three to five spans each and two of the bridges are girder bridges of three spans each, all supported on reinforced concrete abutments and bents. The abutments of eight bridges are to be on steel piles, and the abutments of four bridges are to be on spread footings. The bents of all bridges are to be on spread footings.

Approximate quantities of the major items of construction are as follows:

Roadway Excavation	1,180,000 cubic yards
Borrow	200,000 cubic yards
Structural Concrete	16,500 cubic yards
Reinforcing Steel	2,500,000 pounds
Fabricated Structural Steel (including furnishing, fabrication, and erection)	3,500,000 pounds
Fabricated Structural Steel (excluding furnishing and fabrication)	1,500,000 pounds
10" Reinforced Concrete Pavement	128,000 square yards

The fabricated structural steel and structural expansion and/or contraction joints for the Black River Bridge, shown above in the amount of 1,500,000 pounds, will be furnished to the Contractor by the Commission.

Copies of the Plans and General Specifications for said Contract will be available on or about June 14, 1954, and thereafter (and in any event, no later than June 15, 1954) for public inspection or purchase at the office of the Chief Engineer, Ohio Turnpike Commission, 139 East Gay Street, Columbus 15, Ohio. These documents may be purchased from the Chief Engineer for the following sums, per set, which sums are nonreturnable:

General Specifications for Ohio Turnpike Project No. 1	$ 5.00
Plans (also soil profiles and boring logs)	15.00
Cross Sections	25.00

Forms or copies of all remaining Contract Documents, including the Proposal for the above Contract; the Affidavit which must accompany the Proposal; this Notice to Bidders; the Special Provisions applying to said Contract; the Contract to be entered into with the successful Bidder; and the Contract Bond to be furnished with such Contract, will be furnished upon request and without charge to any interested person at the aforesaid Chief Engineer's office, on and after June 22, 1954.

All proposals must be on the form prescribed by the Commission and must comply with the terms and conditions set forth in the Contract Documents.

The Proposal must be accompanied by a certified check or checks on a solvent bank or banks, payable to the order of the Ohio Turnpike Commission in an amount not less than $100,000. The Commission may at any time cash any such check. Each such check or the proceeds thereof will be held by the Commission as a guaranty that, if any Proposal guaranteed thereby is accepted, a Contract will be entered into and the performance of the Proposal secured. Each such check or the proceeds thereof will be returned or forfeited as provided in paragraphs G-3.03 and G-3.06 of the aforesaid General Specifications.

All bids must be received at or before 10:00 A.M., Eastern Standard Time, July 7, 1954, in the offices of the Ohio Turnpike Commission, 139 East Gay Street, Columbus 15, Ohio. At said hour, the bid box will be removed to the Neil House Hotel, 41 South High Street, Columbus, Ohio, where all proposals will be publicly opened and read.

The award of the Contract, if any award be made, will be to the Bidder whose Proposal is lowest and best for the performance of the work, and complies with all the prescribed requirements. The Commission reserves the right to reject any or all Proposals and to waive technicalities.

OHIO TURNPIKE COMMISSION

OFFICIAL PROPOSALS

Bids: June 29, 1954

Seal Coating New York International Airport

THE PORT OF NEW YORK AUTHORITY
CONTRACT O & M 245
PROPOSAL NO. 455

Sealed proposals for furnishing all labor, material and equipment necessary for seal coating areas at New York International Airport, Jamaica, N. Y., will be received at the office of the Department of Purchase and Administrative Services, The Port of New York Authority, Room 900, 111 8th Ave., New York 11, until 11:00 A.M. (D.S.T.) Tuesday, June 29, 1954, at which time and place said proposals will be publicly opened and read.

Contract documents may be seen at the office of the Department of Purchase and Administrative Services, The Port of New York Authority, Room 900, 111-8th Ave., New York 11, and copies will be furnished upon deposit of $10.00 per set. Deposit must be delivered to the Treasury Department, Room 719, where a receipt in duplicate will be issued. The duplicate copy of the receipt is then to be delivered to the Department of Purchase and Administrative Services, Room 900, 111-8th Ave., New York 11, and you will be furnished with the contract documents. The deposit will be refunded if the documents are returned in good condition, not later than thirty days after the opening of proposals. The deposit will be forfeited if the documents are not returned within thirty days.

THE PORT OF NEW YORK AUTHORITY
Howard S. Cullman, Chairman

Bids: Jul 13, 1954

Contract 441

CLEARING AND GRUBBING
PEPACTON RESERVOIR

SEALED BIDS will be received by the Board of Water Supply, at its offices, thirteenth floor, 120 Wall Street, New York City, until 10:00 A.M., Eastern Standard Time, on Tuesday, July 13, 1954, for Contract 441, for clearing and grubbing the easterly portion of the Pepacton reservoir and performing related work, in the Towns of Middletown, Andes and Colchester, Delaware county, New York. The work will comprise the clearing of approximately 700 acres, the grubbing of about 580 acres, required excavation and removal of excrementitious material and, to the extent specified, the collection and disposal of debris carried or deposited by the streams from the entire reservoir area and the cleaning of certain wooded and adjacent areas upstream of the reservoir, all as set forth in the specifications.

No bid will be received and deposited unless accompanied by a certified check upon a National or State bank, drawn and made payable to the order of the Comptroller of The City of New York, in the amount of thirty thousand dollars ($30,000.00) for the proper execution of the contract.

At the above place and time the bids will be publicly opened and read. Pamphlets containing information for bidders, forms of bid and contract, specifications, contract drawings, requirements as to surety, etc., can be obtained in Room 1316 at the above address, upon application in person or by mail, by depositing the sum of five dollars ($5.00) i ncash or its equivalent for each pamphlet. Within 30 days following the award of contract or rejection of bids, the full amount of such deposit will be refunded for each pamphlet submitted as a bid and a refund of four dollars ($4.00) will be made for each other pamphlet returned in acceptable condition. For further particulars, apply at the office of the Chief Engineer at the above address.

IRVING V. A. HUIE, President, EDWARD C. MAGUIRE, HERBERT M. ROSENBERG, Commissioners, Board of Water Supply; BETTY COHEN, Acting Secretary.

OFFICIAL PROPOSALS

Bids: June 29, 1954

Contract No. 48

WEST VIRGINIA TURNPIKE COMMISSION

ADVERTISEMENT FOR PROPOSALS

Sealed proposals will be received by the West Virginia Turnpike Commission for:

CONTRACT NO. 48

The work to be done under Contract No. 48 consists generally of furnishing all labor, materials and equipment for constructing three (3) permanent buildings, complete with mechanical services. These buildings shall be located on the West Virginia Turnpike property at the Beckley Maintenance Area near Beckley, Raleigh County, West Virginia.

The work of constructing the three (3) permanent type buildings complete with all services will be let under a single contract, Contract No. 48.

The three (3) buildings are as follows:

1. Maintenance Building
2. Materials and Equipment Storage Building
3. Paint Spray and Storage Building

Proposals will be received at the office of the West Virginia Turnpike Commission, Post Office Box 1469, Charleston 5, West Virginia, until 1:00 p. m. Eastern Standard Time and thereafter at the House of Delegates Chamber, State Capitol, Charleston, West Virginia, until 2:00 p. m. Eastern Standard Time, on June 29, 1954, at which time and place said proposals will be publicly opened and read.

WEST VIRGINIA
TURNPIKE COMMISSION
D. H. Morton
Chairman

Bids: July 15, 1954

Construction of Irrigation System

PUERTO RICO WATER RESOURCES AUTHORITY
SAN JUAN, PUERTO RICO

Commonwealth of Puerto Rico, PUERTO RICO WATER RESOURCES AUTHORITY, SAN JUAN, PUERTO RICO. Sealed proposals will be received at San Juan, Puerto Rico until 2:00 o'clock P.M., July 15, 1954 for the construction of earthwork, canal lining, and structures from station 400+00 to station 809+00 of main canal, including approximately 210,000 cu yd excavation, 88,000 sq yd canal lining, 2,850 cu yd concrete in structures, 2,000 lin ft various size concrete pipe, weirs, gates, etc. The work covers the second stage of Lajas Valley irrigation system in the Southwestern area of Puerto Rico near the towns of Yauco and Lajas.

Plans, Specifications, and Contract Documents may be obtained at the office of the Purchasing Officer, Puerto Rico Water Resources Authority, San Juan, Puerto Rico upon deposit of one hundred dollars ($100.00) in cash, money order or certified check payable to the Puerto Rico Water Resources Authority. Deposit will be returned in full upon return of the plans and specifications within twenty (20) days after the opening of the bids.

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-4189) will be received at Bismarck, North Dakota, until July 20, 1954, for furnishing labor and materials for constructing Garrison-Voltaire transmission line approach to Garrison switchyard and dismantling Garrison-Fort Peck temporary tie, Transmission Division, North Dakota, Missouri-Souris District, Missouri River Basin Project. Location: Mercer and McLean Counties, North Dakota. Principal items are: 40 footings—constructing reinforced concrete steel tower footings; 11 towers—erecting steel towers; 3 structures—furnishing and constructing wood pole structures; 76 assemblies—furnishing, assembling, and attaching insulator assemblies; 2.65 miles of line—furnishing and stringing ACSR conductors; 2.65 miles of line—furnishing and stringing overhead ground wires; 216 dampers—furnishing and attaching vibration dampers; lump sum—dismantling and salvaging 115-kv Garrison-Fort Peck temporary tie and appurtenant work; and other work. Completion time 330 days. For particulars, address Bureau of Reclamation, Bismarck, North Dakota; or Building 53, Denver Federal Center, Denver, Colorado. W. A. Dexheimer, Commissioner.

CLASSIFIED SEARCHLIGHT SECTION ADVERTISING

EMPLOYMENT • BUSINESS • OPPORTUNITIES • EQUIPMENT—USED or RESALE

UNDISPLAYED RATE:
(Not available for equipment advertising)
$1.80 cents a line, minimum 3 lines. To figure advance payment count 5 average words as a line.
POSITION WANTED undisplayed advertising rate is one-half of above rate, payable in advance.
PROPOSALS, $1.80 a line an insertion.

INFORMATION:
BOX NUMBERS count as 1 line additional in undisplayed ads.
DISCOUNT OF 10% if full payment is made in advance for four consecutive insertions of undisplayed ads (not including proposals).
EQUIPMENT WANTED or FOR SALE Advertisements acceptable only in Displayed Style.

DISPLAYED—RATE PER INCH:
The advertising rate is $20.50 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.
AN ADVERTISING INCH is measured ⅞ inch vertically on one column, 3 columns—30 inches—to a page. E.N.R.

Send NEW ADVERTISEMENTS: To New York Office W. 42nd St., N. Y. 36 for July 1st issue closing June 21st.

ENGINEERS
Foreign Service

Graduate Chemical, Mechanical, Electrical & Construction Engineers with minimum of 5 years' experience. For specialized assignments commensurate with qualifications in various phases of construction, estimating materials and cost control, planning and refinery process work. Write giving full particulars regarding personal history and work experience. Please include telephone number.

Recruiting Supervisor, Box 30

Arabian American Oil Company

505 Park Avenue, New York 22, N. Y.

REPLIES (Box No.): Address to office nearest you
NEW YORK: 333 W. 42nd St. (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

POSITIONS VACANT

GRADUATE CIVIL or structural engineer with a minimum of 3 years recent building construction experience wanted for supervision of new construction on large midwest university campus. This is a good opportunity for a permanent connection for a younger man with ability. Please give summary of education, experience and salary requirements in reply. P-2958, Engineering News-Record.

BRIDGE—HIGHWAY Engineers—Designers—Draftsmen. For work on bridges, expressways and turnpikes. Location Midwest. Permanent positions with periodic promotions depending on experience and ability. Paid vacations, sick leave, hospitalization and life insurance. Include education, experience, reference and salary expected in application letter. P-2109, Engineering News-Record.

MUNICIPAL ENGINEER: C.E. or L.S., as Assistant Engineer, Public Works Department, New York metropolitan area. Responsible charge of field work and drafting room. Submit full personal education and experience resume to Box P-2953, Engineering News-Record.

EXPERIENCED STRUCTURAL Engineer for Design and Estimating Industrial type Buildings. Write Allied Steel Products Corporation, P. O. Box 6168, Tulsa, Oklahoma.

EXPERIENCED STRUCTURAL Steel Detailers and Checkers. Write Allied Steel Products Corporation, P. O. Box 6168, Tulsa, Oklahoma.

FOREMEN FOR Bridge Construction. Pile-driving, concrete, cofferdams, structural steel. Well established Southern firm adding to permanent organization. State age, salary expected, education, availability, give detailed resume experience and list references. P-2879, Engineering News-Record.

CIVIL ENGINEER to teach surveying and related subjects. Permanent position. G.L. Crawford, Southern Technical Institute, Chamblee, Georgia.

CONSTRUCTION SUPERINTENDENT

Man with up-to-date experience in handling medium size and large heavy construction projects in the New York area. The man we want must have references to demonstrate that he has recently run jobs (not cost plus or fee) either in highway, subway or sewer construction.

Reply giving age, detailed resume of experience and salary required.

P-2974, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

LANDSCAPE—CIVIL ENGINEERING DRAFTSMAN
Opening exists for man trained or experienced in highway planning and engineering. Capable of preparing working drawings required for road construction, alignments, grading, drainage, etc. Call, write or apply in person to J. A. Fuller, Director of Employment.
COLONIAL WILLIAMSBURG
Williamsburg, Virginia

POSITIONS VACANT

CHIEF ENGINEER for general contractor operating Southern states all types heavy construction including highways, tunnels, bridges, foundations, piledriving, railroad, marine work, earthfill dams, bituminous and concrete paving, utilities, etc. Assume responsibility estimating, purchasing, cost control, subcontracts, general field supervision. State age, education, salary expected, experience, references, availability, all in detail first letter to Box P-2880, Engineering News-Record.

WANTED: Instructor of Engineering Drawing and descriptive geometry. Salary up to $4,700 for 9 month period and assistant professorship for qualified person. M. E. graduate preferred. Dept. of Engr. Drawing, University of North Dakota, Grand Forks, North Dakota.

WANTED, ENGINEERS, competent and experienced in design and supervision of construction as resident engineers on water works, sewer systems, sewage and water treatment. State experience, when available, salary requirements, references. Box P-2893, Engineering News-Record.

MALE HELP Wanted: Experienced Structural Draftsman. Personnel—Box 1087, Charlotte 1, N. C.

WANTED BY long established Consulting Engineer the following men for permanent positions: Bridge Designer with at least 5 years experience in both steel and reinforced concrete. Structural Engineer, recent graduate with good theoretical knowledge. Highway Engineer, experienced in interchange design. P-2913, Engineering News-Record.

WANTED: STRUCTURAL steel detailer and checker for North Carolina Fabricator. Please submit resume of experience and salary required. P-2980, Engineering News-Record.

ENGINEER TO plan and direct Engineering Department in expanding suburban community. Population 15,000. Six years experience. $6,800-$8,000. Merit System. Request details and application before June 30 from Office of Selectmen, 150 Main Street, Wethersfield 9, Connecticut.

(Continued on the following page)

FOREIGN SERVICE

INSPECTION ENGINEER

Graduate engineer with minimum 5 years experience maintaining and inspecting pressure vessels and oil handling equipment, or 5 years of experience in structural inspection, diversified construction work and field engineering. Must have thorough knowledge of A. P. I. and A. S. M. E. codes for fired and unfired pressure vessels and for pressure piping.

INSPECTION METHODS ANALYST

To develop inspection methods and promote maximum thoroughness and efficiency. Graduate engineer or metallurgist with 10 years experience in design or inspection of petroleum producing and refining equipment, 5 years of which experience must be in inspection work entailing all-round knowledge of the plant equipment found in petroleum producing and refining.

Write giving full particulars regarding personal history and work experience. Please include telephone number.

Recruiting Supervisor, Box 40

ARABIAN AMERICAN OIL COMPANY
505 Park Avenue
New York 22, New York

HIGHWAY and BRIDGE DESIGNER

Experience required in highway and structural design. Excellent opportunity for Engineers qualified to design modern expressways and bridges. Location in Harrisburg, Penna. with excellent living conditions. Include experience and salary requirements in first letter.

GANNETT FLEMING CORDDRY & CARPENTER, Inc.
P. O. Box 366 Harrisburg, Pennsylvania

POSITIONS VACANT
(Continued from preceding page)

DEPUTY BUILDING Inspection Supervisor: Graduation from an accredited four year college with degree in structural or architectural engineering. Seven years of experience in the structural design of buildings and some experience in examination of plans and specifications of building projects and applications for building permits. Salary $5668-$6708 per year. Complete details by writing to Director of Personnel, Municipal Building, Hartford, Conn.

STRUCTURAL ENGINEER: Graduation from a college or university of recognized standing with a degree in engineering, specializing in structural engineering, and 5 years experience in a responsible capacity involving design of all sizes and classes of buildings and structures or an equivalent combination of experience and training. Salary $5408-$6240 per year. Complete details by writing to Director of Personnel, Municipal Building, Hartford, Conn.

STRUCTURAL DESIGNERS, draftsmen and heckers preferably with previous highway bridge experience. Immediate positions in Metropolitan New York area. Box P-3037, Engineering News-Record.

CHIEF STRUCTURAL Designer—Must have extensive experience in highway bridge design. Supervisory ability. Location—Metropolitan New York. Box P-3038, Engineering News-Record.

SALES ENGINEER—We need experienced concrete or concrete construction engineer. Must have sales ability and potential to organize and head branch office. Salary, expenses and commission. Various locations. Considerable traveling. Interesting, long term, independent position. Sika Chemical Corporation, Passaic, New Jersey.

SELLING OPPORTUNITIES OFFERED

SALES ENGINEER — Rochester, New York and Pittsburgh, Pennsylvania territories open with established national concern selling prefabricated metal products to engineering and construction markets. Positions are permanent and offer excellent future with aggressive, progressive and expanding organization. Engineering degree desirable. Previous sales experience unnecessary. Ages 24 to 30. Car furnished. Complete training program. Salary and bonus. RW-2289, Engineering News-Record.

WANTED: ESTABLISHED Sales organization or individual to handle leasing of Machinery and equipment for the manufacture of concrete roofing tile on attractive commission basis. Excellent opportunity for party with aggressive traits of initiative and knowledge of concrete. Write giving full particulars. Replies confidential. Concrete Products Machinery, Inc., 1930 Wilshire Boulevard, Los Angeles 57, Calif.

EMPLOYMENT SERVICE

OVERSEAS PROJECTS Guide to most active constructors-engineers, oil co's., gov't & UN groups hiring for foreign projects. Send $1. Cove-McKane Int., GPO Box 126E, NY 1, NY.

POSITIONS WANTED

PROJECT MANAGER or Contractor's executive available. Broad experience heavy construction and buildings. Thorough organizer. Sound knowledge of field supervision, estimating, cost control, purchasing, subcontracts. New York preferred. PW-2942, Engineering News-Record.

BITUMINOUS PAVING and grading Superintendent. College and ten years experience. Ambitious, aggressive, desires responsibility and large work volume. PW-2941, Engineering News-Record.

PROJECT SUPERINTENDENT capable of estimating handling sub contractors and running entire project. Age 37. 18 years' experience, will travel, minimum salary $800.00 per month. PW-2894, Engineering News-Record.

PROJECT MANAGER—General Project Superintendent:—Available to Man, Plan, and handle all phases of any medium or large scale Contracts: Practical experience; Service background includes combination of Multi-Story Bldgs. & Unclassified heavy Construction: for commercial, industrial, private & governmental public works: Large earth & rock exec's. Mass & Reinf. concrete, cofferdams, open foundations, bridges, viaducts, dams, steam & hydropower, misc. utilities, R.R. Grade separations, highways, airports, etc. Profit-Minded-Mature-Judgment; References. PW-3002, Engineering News-Record.

GENERAL SUPERINTENDENT—thirty years' experience, thorough knowledge all phases construction work consisting of building, airport, road, railroad, concrete, sewer and drainage, heavy excavation, dams, bulkheads, jetties, estimating, supervision and maintenance of construction equipment. Available now for either foreign or domestic work. References available. Box PW-3023, Engineering News-Record.

FRANCE

Sale by Call for Bids under sealed envelopes
on Monday June 28 at 3 P.M.
of a lot of

6" PIPE-LINE TUBES

Heavy type—1,500 tons approximately—with "VICTAULIC" joints.
Stored at Toul Domgermain (Meurthe-et-Moselle)

— Material from U. S. war surplus stocks.
— Bids to be submitted per metric ton and in U. S. dollars.
— Compulsory payment in U. S. dollars.
— All information and specifications available from:

Societe Nationale de Vente des Surplus
14 Avenue de la Grande Armée. Paris 17. Telephone: Galvani 49-37.

POSITIONS WANTED

ESTIMATOR, HEAVY Construction. Organize for continuous bidding, cost control, etc. Extensive experience foundations, piles, bridges, tunnels etc., in New York area. PW-3003. Engineering News-Record.

CONSTRUCTION EXECUTIVE — Architect — registered many states. Finest training and references. Familiar all phases industrial, monumental and governmental projects. Presently associate head of large professional firm. Desires new connection where permanency and management participation is assured. Twenty five years experience. Box PW-2608, Engineering News-Record.

STRUCTURAL ENGINEER, 30, single, Master's degree; 5 years diversified experience bridges and buildings, including responsible work in charge of design; desires work overseas, preferably Europe; knowledge French and Experience French engineering and construction practices. PW-3042, Engineering News-Record.

BOOKKEEPER (FEMALE), Jr. Accountant experienced. Grad. NYU, will travel. Desires position with large N.Y.C. engineering concern. PW-3027, Engineering News-Record.

EXECUTIVE ENGINEER Graduate engineer with 18 years proven success in development, negotiation, sale and execution of contracts for capital equipment and construction of power plants, cement mills and other industrial facilities, particularly in foreign fields. Intimately familiar with all top level problems of foreign trade. Widely traveled, personable, with top references, seeks opportunity to use proven ability. Presently in New York, willing to relocate. PW-3043, Engineering News-Record.

CIVIL ENGINEER, 14 years experience. Desires position with general contractor. Estimating, purchasing of material & sub-contracts, expediting, cost control. Location immaterial. Lawrence Stotts, 6713 Anita, Dallas, Texas.

STRUCTURAL ENGINEER, 28 years experience subways, buildings, foundations, docks, chemical and power plants, indeterminate analysis. PW-3039, Engineering News-Record.

PART TIME WORK WANTED

PART TIME Work—Retired licensed structural engineer available for structural design, shop detailing, estimating. PTWW-3025, Engineering News-Record.

LEARN ESTIMATING
Complete Building Estimators Course, also Building Labor Calculator for practicing estimators. Thirty-fourth year serving the building industry. For free trial and all particulars write:
TAMBLYN SYSTEM
1420 Gilpin St. Denver 6, Colorado

Engineers—Foremen—Office Men
Learn latest methods to organize and run work. Prepare for the top jobs.
Send post card for details.
GEO. E. DEATHERAGE & SON
CONSTRUCTION CONSULTANTS
411 So. 5th Ave. Lake Worth, Florida

STRUCTURAL ENGINEERING
ARCHITECTURAL ENGINEERING
OUR COURSES of instruction by mail HAVE HELPED THOUSANDS to better positions and to pass State Board Examinations. Forty third year
WILSON *Engineering Corp*
College House Offices, HARVARD SQ., CAMBRIDGE, MASS.

GLAZER STEEL Corp.
Structural and Plate Steel Fabricators
Open capacity for quick delivery now available. We solicit your inquiries for Steel Fabrication and Warehouse Steel Products. Let us figure your jobs . . . Large or Small.
Contact us at either New Orleans or Knoxville
P. O. Box 867, New Orleans, La., Phone, Express 2761
P. O. Box 1390, Knoxville, Tenn., Phone 4-8601

WANTED

WANTED
FORMS FOR CONCRETE PAVING
3000 ft., 15"x19" steel dual purpose forms for airport paving or 3000 ft., 15"x15" steel forms for airport paving.
B. PERINI & SONS INC.
Framingham, Mass.

WANTED
3 USED GUY DERRICKS
85-110' Booms, 100 to 125' Masts, 20 Ton Capacity At Full Boom; 3 Used Electric Hoists to Lift 20 Tons At Full Boom At 60 F.P.M.
CLEVELAND QUARRIES CO.
AMHERST, OHIO

Your inquiry will have Special value . . .

If you mention this magazine, when writing advertisers. Naturally, the publisher will appreciate it . . . but, more important, it will identify you as one of the men the advertiser wants to reach with this message . . . and help to make possible enlarged future service to you as a reader.

GOOD buys in *USED* Truckmixers

We have the Largest Selection of

USED TRUCKMIXERS

In The Country

12—4½ Yard High Discharge Truckmixers.....Jaeger and Rex
6— 4 Yard Horizontal Type Truckmixers.....Jaeger and Blaw Knox
6—5½ Yard High Discharge Truckmixers.....Jaeger and Ransome
16—5½ Yard Horizontal Type Truckmixers.....Jaeger and Rex
7—6½ Yard High Discharge Truckmixers.....Jaeger
1— 8 Yard Horizontal Type Truckmixer.....Jaeger
1—3½ Yard Horizontal Type Truckmixer.....Ransome

ALSO

16—10 Wheel Mack Trucks—Models LF-LJ and LM
8—10 Wheel White Trucks

All Equipment is in our New York or New Jersey Yards

CALL OR SEE US AT

JAEGER-LEMBO MACHINE CORPORATION

Northern Blvd. and 127th Street
Flushing, New York
Phone Newtown 9-7777

Highway 22
Springfield, New Jersey
Millburn 6-1066

CRANES FOR SALE

CRAWLERS:
Lima 604
Lima 750
P and H 655 BLC
P and H 955-A
Manitowoc 3000B

TRUCK CRANES:
P and H 255A
P and H 150
Lorain MC414

All modern and top condition. Used on hook work only. All with long boom and jib.

ROGER SHERMAN TRANSFER COMPANY
East Hartford, Connecticut
Jackson 8-4105

FOR SALE

2—D8's w/Power Units & Bulldozers—2U Series
6—D8's w/Power Units—2U Series
2—HD-19's w/Push Blocks
6—TS-300 Motor Scrapers
3—Caterpillar #80 Scrapers
3—LaPlante Choate C-314 Scrapers
1—D7 w/Power Unit & Bulldozer 3T Series
1—HD-5 w/Front end Loader
1—Bros #67W Pneumatic Roller
6—Sheepsfoot Rollers
5—Caterpillar Motor Graders 8T Series
1—80D Northwest Shovel
1—#6 Northwest Shovel
1—#95 Northwest Dragline
3—#25 Northwests
1—605 Koehring Dragline
3—27FD End Dump Euclids
3—13FDT Bottom Dump Euclids
5—Koehring Dumptors
9—F-6 1952 Ford Dump Trucks
2—34E Twinbatch Pavers
2—500 cu.ft. Joy Compressors & Wagon Drills

Light Plants & Other Miscellaneous Items

PERRY McGLONE CONST. CO.
1401 Fairfax Trafficway
Kansas City, Kansas Tel. Atwater 4444

FOR SALE

16" DIESEL AND ELECTRIC HYDRAULIC DREDGE "JOHN SCOTT"

WITH ALL AUXILIARIES AND ACCESSORIES

(GOOD CONDITION)

Dredge, "John Scott", 16 in. hydraulic, cutter-head type: Capacity approximately 275 cu.yd. per hour, dredging depth 32 ft. below water level, towing clearance height 32 ft. 8 in., eight riveted type pontoons bolted together to form hull approximately 105 ft. long, 30 ft. wide, 5 ft. 6 in. deep, structural steel frame deck house 88 ft. long, 25 ft. wide, 15 ft. high, control room mounted on deck house, 25 ft. wide, 20 ft. long, 8 ft. 4 in. high. All necessary pumps, spuds, hoists, diesel engine and electric motor drive and control equipment, fuel tank, floated pipe line, shore pipe, standby equipment and parts.

For inspection and further information communicate with Tennessee Valley Authority, Division of Materials, Sales and Transfer Section, Chattanooga, Tennessee, Telephone 5-3551, Extension 673, or Superintendent, Construction and Maintenance Branch, Wilson Dam, Alabama, Telephone Sheffield, Alabama, 3160, Extension 5221.

TENNESSEE VALLEY AUTHORITY

DIVISION OF MATERIALS CHATTANOOGA, TENNESSEE

CARLYLE
INDUSTRIAL RUBBER PRODUCTS FOR EVERY PURPOSE

IMMEDIATE DELIVERY OF CONVEYOR, ELEVATOR AND TRANSMISSION BELTING — FIRE, WATER, SUCTION, AIR, STEAM AND WELDING HOSE

AIR HOSE
WATER HOSE
SUCTION HOSE
DISCHARGE HOSE
STEAM HOSE
FIRE HOSE
OIL HOSE
HYDRAULIC HOSE
WELDING HOSE
VACUUM HOSE

CONVEYOR BELTING
ELEVATOR BELTING
TRANSMISSION BELTING

LOW PRICES!

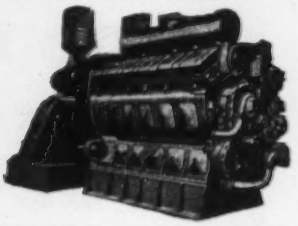
Immediate Deliveries

SEND FOR NEW 1954 CATALOG

CARLYLE RUBBER CO., Inc.
62-66 Park Place, New York 7, N. Y.
Phone: Digby 9-3810

DIESEL POWER

IMMEDIATE SHIPMENT
• PURCHASE OR RENTAL
UNIT CAPACITIES—10 TO 2475 KVA
A.C.—50 AND 60 CYCLES
• ALSO D.C. UNITS



A PARTIAL LISTING OF OUR INVENTORY

KW	Make	Model	HP	RPM	KW	Make	Model	HP	RPM
1180	Worthington	SEH-8	1685	360	400	Ingersoll-Rand	S-8	600	720
1136	Fairbanks Morse	38D	1600	720	350	Baldwin	VO-6	510	450
1100	General Motors	16-278A	1600	720	320	Enterprise	DSG-6	560	450
750	General Motors	12-567	1080	720	300	General Motors	8-268A	450	1200
700	Worthington	EE-8	1000	327	200	General Motors	8-268A	350	900
500	General Motors	8-278A	750	720	150	Worthington	CC-4	225	450
500	General Motors	8-567	720	720	150	Ingersoll-Rand	S-4	225	600
500	Alco	6-12 1x13T	750	600	150	Buckeye	80	240	600
480	Worthington	DD-8	700	360	100	General Motors	3-268A	150	1200
400	sterling	VDS-8	600	1200	60	General Motors	6-71	90	1200

A. G. SCHOONMAKER COMPANY, INC.
DIESEL DIVISION, 50 CHURCH ST., NEW YORK 7, N. Y.

FOR SALE or RENT

1¾ yd Manitowoc 3000A diesel cranes 65' boom. Cat. D13000 engine.
½ yd Link Belt LS50 Backhoe-Crane.
10 ton Unit No. 1020 Pneu. Tired Crane.
30 ton Industrial Brownhoist Gas Locomotive Crane. 70' bm.
44 ton GE Diesel-Elec. Loco. new 1951.
25 ton GE Diesel-Elec. Loco. new 1950.
30 yd Western & Koppel Air Dump Cars.
25 ton Wiley Steel Stiffleg Derrick.
1200 CFM. Ing. Rand XRE, 200 HP Air Compr.
130 HP Christian 2D Diesel Hoist.
60 ton Clyde Elec. Revolver or Gantry.

MISSISSIPPI VALLEY EQUIPMENT CO.
509 Locust Street St. Louis 1, Mo.

FOR SALE

Concrete batch
and
Mixing plant

complete with 55 cu. yd. aggregate & cement bins; 2 cu. yd. mixer and semi-automatic cement & water batchers; under track screw conveyor; 1032 bbl. cap. cement silo with elevator.

Blaw-Knox under track car unloader.

Model 200D Pumpcrete with pugmill remixer, bath gas engine driven, complete with pipe and accessories.

All in good condition and ready for immediate delivery.

CRAMER-VOLLMERHAUSEN CO., INC.
2601 Conn. Ave., N. W. Washington 8, D. C.
Phone North-7489

LOCOMOTIVES

1—Plymouth—8 Ton 30" Ga.—Gas.
1—Plymouth 8 Ton Gas. Std. Ga. #4095.
1—G.E. 44 Ton—Heavy Duty Diesel Elec.—1951.
Whitcomb 65 T—Diesel Electric.
1—Brookville—8 Ton—Std. Ga. #2877.
1—Brookville 3 Ton—Gas—24" Ga.—#3042.
1—Whitcomb—30 Ton—Diesel—Std. Ga.—#40154.

2—Brookville—12 Ton Std. Ga.—Diesel—New. Automatic Air Brakes & Couplers—BARGAINS

1—Orton—15 Ton—Diesel Locomotive Crane #42832 Very Good.
2—Conway Mod. 75 Muckers, #256 & #305.
Mundy 2-Drum Elec. Hoist—300 H.P. Like New.
Bridgeford Axle Lathe.
Orton 30 Ton Diesel Locomotive Crane. Modern.
2—50 Ton Twin Hopper Cars.
1—Whiting Type B 35 Ton—Pit Drop Table—New
Southwark 500 Ton Hyd. Press—Hi-Speed—Like New

R. H. BOYER
2005-13 W. Bellevue St. Philadelphia 40, Pa.
Phone Sagamore 2-7132

For Rent

SPEEDCRANES
LATE MODELS

Manitowoc Diesel Powered Speedcranes for rent. 25, 40 and 60 ton capacities with booms 100' or more, 20' and 30' jibs. Special price on long rentals.

FORSYTHE EQUIPMENT CO., INC.
37-11 Vernon Blvd. Long Island City, New York
Tel. STillwell 4-1030

LOCOMOTIVE CRANES
FOR SALE or RENT

1—30 Ton Orton Diesel, 1943
2—30 Ton Browning Diesel, 1943

B. M. WEISS COMPANY
Girard Trust Company Bldg.
Philadelphia 2, Pa.

FOR SALE

1—20 Ton Cap. Bay City Cranemobile Model 180-T50 with 70' Boom & 15' Jib Late Model — $18,500.00

1—Model 25 Northwest Diesel Dragline with 40' Boom & 28" Shoes 1948 Model — $10,500.00

1—DW-10 Caterpillar Tractor with Hydraulic Side Dump, 10 Yard Cap. Wagon — $5,000.00

All in A-1 condition—Immediate Delivery
F.O.B. Milwaukee, Wisconsin

MERTES MACHINERY COMPANY
1622 SOUTH FIRST STREET
MILWAUKEE 4, WISCONSIN

FOR RENT:—

PILE HAMMER

1 new #1 Vulcan Pile Hammer with McDermid Base

CHARTER OAK CONSTRUCTION CO., INC.
525 Main St. Hartford, Conn.

NEW AND REBUILT
STORAGE BATTERY
LOCOMOTIVES
1½ to 10 Ton — 18" to 56" Track Gauge
GREENSBURG MACHINE CO.
Greensburg, Penna.

CONTRACTORS
ENGINEERS

FOR SALE OR RENT

EUCLIDS — TRACTORS — SHOVELS

2—50 TON COMPACTORS WITH 2—D8 CAT. TRACTORS
2—6 FT. SHEEP FOOT ROLLERS WITH 2—TD18 TRACTORS
AVAILABLE AT ONCE

9—EUCLID SCRAPERS 18-23 CU. YD.
WITH 275 H. P. CUMMINS ENGINES
3—HD-20AC PUSH TRACTORS
ALL BOUGHT NEW BY US. USED 1½ SEASONS AND REBUILT TO A1 CONDITION. AVAILABLE AT ONCE.

1—#6 NORTHWEST SHOVEL AND CRANE COMBINATION. NEW
AND
5—END DUMP EUCLIDS 15 TON AVAILABLE AT ONCE

1—22 BUCYRUS ERIE TRUCK CRANE (NEW)
FULLY EQUIPPED DRAG LINE AND CLAM BUCKET 70' BOOM

1—80D NORTHWEST SHOVEL OR COMBINATION
WITH
10—BOTTOM DUMP EUCLIDS—13-17 YD. AT ONCE

1—1201 LIMA SHOVEL 3½ YD. NEW FALL 1953
1—80 NORTHWEST SHOVEL AND CRANE 80 FT. BOOM COMB.
20—BOTTOM DUMP EUCLIDS 13-17 CU. YD.
AVAILABLE JULY 1, 1954

1—COMPLETE GREASE TRUCK UNIT
6—LIGHT PLANTS & WELDER COMBINATION
ON 4 WHEEL TRAILERS G. E.
4—#12 CAT. MOTOR GRADERS

10—D8 TRACTORS LATE 2U MODELS CATERPILLAR
WITH
6—15-18 CU. YD. SCRAPERS AVAILABLE AT ONCE

A. L. DOUGHERTY CO.
Contractors

GUARANTY BLDG.
INDIANA, IND.

SOUTH PEARL ST.
ALBANY, N. Y.

Contact: Robert B. Cleary, Phone Albany 3-2435

PILE DRIVING EQUIPMENT

Vulcan and McKiernan-Terry
Steam Pile Hammers and Extractors
Drop Hammers - Driving Caps
Steel Leads - Pile Driver Hose
Hoists and Boilers

CONTRACTORS MACHINERY CO.
Phone VAlentine 4740 — 2637 SOUTHWEST BLVD KANSAS CITY 8, MO.

MISCELLANEOUS EQUIPMENT

4—Ingersoll-Rand Wagon Drills
1—15 cubic yard Fruehauf Semi Trailers—Dump Body
2—15 ton Fruehauf Flat Bed Semi Trailers
2—Diamond T Tractors
1—D-8 Bulldozer
3—Euclid 8 cubic yard End Dump Trucks
2—Ames Vertical 60 H.P. Boilers
1—National Vertical 40 H.P. Boiler
1—Erie Horizontal 80 H.P. Boiler
All boilers are equipped with oil burners

Subject to prior sale

FRAZIER-DAVIS CONSTRUCTION COMPANY
1319 Macklind Avenue, St. Louis, Mo. — STerling 1950
Box 188—Grahamsville, New York — Grahamsville 2861

tug for sale

"Capt. Jim"—Steel hull constructed 1942. Overall length: 68 ft., breadth: 17 ft. draft light: 7½ ft., draft loaded: 9 ft.

1 Main engine, Fairbanks-Morse Model, 35F10M, serial number 829233, Diesel, 8 cylinder, direct reversible, 320 horse power, 400 RPM.

Also steel deck barges for sale or charter.

HUGHES BROS., Inc.

Clearing House for Marine Difficulties since 1894

17 Battery Place, New York 4, N. Y.
Tel. WHitehall 4-1048

NEW WIRE ROPE BLOCKS

$10.00 each
While they last

ALL BRONZE BUSHED

14" double-regular diamond pattern
12" drop link snatch with hooks
14" drop link snatch with hooks
16" safety snatch with shackle

ABERTHAW COMPANY
133 Southampton St., Boston 18, Mass.
Tel. Highlands 5-6700

---

4 good used Super C Tournapulls, in good operating condition . . . $4,000.00 each.

3 good used Wooldridge Terracobras, in good operating condition, with tires in good condition, $4,500.00 each, f.o.b. Peoria.

We invite your inspection of these machines.

GIL BOERS EQUIPMENT COMPANY
7625 South Kedzie Ave. Chicago 29, Ill.
PHONE: PRospect 6-4000

FOR SALE
BUCYRUS 375 DRAGLINE
WARD LEONARD CONTROLS
150' Boom—9-½ Yard Dragline Bucket
—Good Condition
FORSYTHE EQUIPMENT CO., INC.
37-11 Vernon Blvd., Long Island City 1, N. Y.

FOR SALE
BUCYRUS-ERIE 44-B CRANE-DRAGLINE
Buda Diesel power, oversize mounting, presently operating at Warren, Ohio.
Bass Eng. & Const. Co., Birmingham, Mich.

FOR SALE
10' GAS PRODUCER
Capacity 50 tons per 24 hours.
G. & W. H. CORSON, INC.
Plymouth Meeting, Pa.

SURVEYING INSTRUMENTS

USED • REBUILT • SALE • RENT • REPAIRING

Our Craftsmen do
INSTRUMENT REPAIR AND OVERHAUL

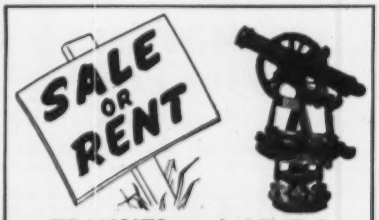
- Complete department—handles all makes.
- Experienced craftsmen do all work.
- Includes thorough overhaul, cleaning, oiling and adjustment.
- Precision work guaranteed.

DAVID WHITE COMPANY
317 W. Court St. • Milwaukee 12, Wis.

INSTRUMENTS FOR RENT

We rent transits and levels on a monthly or yearly basis. Reasonable rates. All instruments are fully guaranteed in first class working order.

DAVID WHITE COMPANY
317 W. Court St. • Milwaukee 12, Wis.



TRANSITS and LEVELS

You will find the best bargains at Warren-Knight. New or rebuilt—for sale or for rent. We will buy, repair, or trade in your used transits, levels, alidades, etc. Send your instruments for valuation.

Catalogues of new and rebuilt instruments, field equipment and drafting room supplies available now.

Send for free Catalog NR48

WARREN-KNIGHT

136 North 12th Street Philadelphia 7, Pa.

FROM STOCK

Brand New & Rebuilt

TRANSITS & LEVELS

Fully equipped modern shop—all makes and models repaired — all work guaranteed — instruments rented

Midwest Representative: W. & L. E. Gurley

NATIONAL BLUE PRINT CO.
Established 1914.
210 S. Canal St. Chicago (6), Ill.

SPECIALIZED REBUILDING

of surveying and engineering instruments.
All makes and models expertly repaired in modern shop. All work guaranteed.

USED REBUILT INSTRUMENTS
for sale or rent

ROY D. HICKERSON
8 N. EDMONDSON AVE. INDIANAPOLIS 19, IND.

RE-BUILT REPAIR RENT REAL EXPERTS

BUFF — ALL MAKES

69 Day St., New York

CONTRACTORS—

Contact these advertisers for new or used surveying instruments

They will also repair damaged or inaccurate instruments.

FOR SALE

1201 Lima Crane combination shovel, Dragline and Clamshell, 3½ cy Esco Bucket

2—Euclid Mod 27FD End Dumps, 12 cy cap 165 HP Cummins, late transmissions
3—Euclid Mod 2FD End Dumps, 12 cy cap 165 HP Cummins, late transmissions
1—500 CFM Chicago V type 100 HP Compressor
1—450 CFM Chicago PB-8 100 HP Compressor
1—500 CFM LeRoi Rex Portable Compressor
4—Johnson Turbine Pumps 200 HP 14" OD
2—Fairbanks-Morse Propeller Pumps 20" OD
1—D-4 Traxcavator
1—Portable 3" Homelite Pump Mod 24
2—Portable 2" Homelite Pump Mod 23
4—Blaw Knox 4 cy Concrete Buckets Ledger wood Type Cableway Unit

ALBENI CONSTRUCTORS
Newport Washington
Phone 275—PO Box 764

FOR SALE

New and Used material—Immediate delivery from stock Angles, Channels, I and WF Beams, especially for Contractors needs

H BEAMS PILE SECTIONS

50 pcs	10" B P S	42#	48/60'
46 "	10" B P S	57#	40/67'6"
60 "	12" B P S	53#	60'
63 "	14" B P S	73#	60/75'

Phone or Wire your steel requirements

We are also interested in purchasing your surplus material.
We assure you our prices will be the best obtainable.

HY DRACHMAN STEEL CORP.
Warehouse 1423 34th Avenue, Astoria, New York AStoria 8-4484 8-8023
Sales Office 563 East Tremont Ave., New York City, N. Y. CYpress 9-5440

PIPE

SURPLUS NEW and USED FOR SALE

SURPLUS EQUIPMENT

FOR SALE OR RENT
With Option to Purchase
Rebuilt—A1 Condition

1 13½ cy Letourneau Scraper
1 48B Bucyrus Erie Shovel 2 cy diesel
1 Model 25 N.W. Shovel ¾ cy diesel
1 Caterpillar D8 Bulldozer
1 Shovel Front for Model 25 N.W.

WILLIAMS CONSTRUCTION COMPANY
Box 145, Balto, 20 Md. Murdock 6-6600

PIPE

VALVES and FITTINGS
All Sizes in Stock
NEW—USED
GREENPOINT IRON & PIPE CO. INC
Bogart and Stagg Streets Brooklyn, N.Y.

When you need PIPE . . . fast

use this section, as many contractors do, as a pipe buying directory. It can save you time when you want to know, quickly, where to buy good new or used pipe.

FOR SALE—IMMEDIATE DELIVERY
C.I. Water Pipe and Fittings-AWWA-Std.
We specialize in Hard to Get—C.I. Pipe and Fittings—such as the following
5L—60" B&S Pipe 12' L. Class B.
2,000 Ft.—30" Pipe—Class B. 12' L.
Pitcast—Reconditioned.
3—60", 24—18", 12—20", 12—24".
Solid Sleeves, all 24" Long Class D.
1—24" True "Y" Branch
Flanged F & D. 125 lbs. also "Y" Branches 3" to 30" B&S Type 2
B&S 45 deg. Bends, 20" to 36" Dia.
1,200—8"—15 deg Bends, 300—8"—90 deg. Bends B&S. Class D.
Also C.I. B&S Pipe 3" to 36"—C.I. Flange Pipe 3" to 24" Dia. Complete line of C.I. Fittings always in stock. B&S and Flanged

TAGCO, INC.
111 Front St., Hempstead, L. I., New York
Telephone—Hempstead 2-5535—8857

CRANES

1—2 cubic yard Lima Combination Crane and Shovel with 100 foot boom plus 25 foot jib.
1—1½ cubic yard Northwest Crane.

Subject to prior sale

FRAZIER-DAVIS CONSTRUCTION CO.
1319 Macklind Avenue, St. Louis, Mo.
STerling 1950
Box 188 Grahamsville, New York
Grahamsville 2861

FOR SALE
Austin Trenching Machine
Model 36-12 serial 10835. Digs to 40" wide and 20' deep. Powered with Twin City engine. Lots of extra parts. $5,800 FOB cars.

TORSON CONSTRUCTION CO.
1890 Woodswether Rd., Kansas City, Mo.

FOR SALE

30 TON INDUSTRIAL BROWNHOIST GASOLINE OPERATED, 70 FT. BOOM LOCOMOTIVE CRANE, EXCELLENT CONDITION. WITH OUTRIGGERS SELF PROPELLED BOTH TRUCKS

JOHN G. HOLBROOK & SON, INC.
MARINE CONTRACTORS
WESTBROOK, CONN.

SAVINGS FLOW FROM SPEED-LAY PIPE SYSTEM

EVERYTHING FOR A COMPLETE PORTABLE PIPE SYSTEM

FOR SALE OR RENT

FACTORY PACKAGED
PIPE COUPLINGS—FITTINGS
VALVES—ACCESSORIES
LIGHTWEIGHT, LABOR SAVING

immediate installation

by one unskilled man. 2½ to 30 o. d. black or galvanized. Ready to lay—without delay.

Complete inventory of all Industrial Pipe, Valves, Fittings, and Flanges.

DELIVERED READY FOR INSTALLATION

SPECIALISTS IN PREFABRICATED PIPING

ALBERT
PIPE SUPPLY CO., INC.
Berry at North 13th St.
Brooklyn 11, N. Y.
Phone EVergreen 7-8100

SEND COUPON NOW!
ALBERT PIPE SUPPLY CO., INC.
Berry at N. 13th St., Brooklyn 11, N. Y.
Please send free booklet describing your Speed-Lay System and services:

NAME .....
FIRM NAME .....
ADDRESS .....
CITY ..... STATE .....

NEED AIR

CALL

American Air of Jersey

AIR FOR SALE OR RENT

SINCE 1902

GAS • DIESEL • STEAM • ELECTRIC

VACUUM PUMPS

55 CFM Lindsay (GAS) Portable
60 CFM Worthington-CPT-Portable
60 CFM LeRoy (GAS) Portable—Skids
89 CFM 6 x 7 Worthington HB—15HP—Elec.
105 CFM Worthington—1R—CPT—Portable
169 CFM 1R—Worthington—Portable
165 CFM Smith 10SR Semi-Portable—25 HP
167 CFM 10 x 5 Ingersoll Vacuum Pump—7½ HP
170 CFM Davey Semi-Portable.—25 HP
195 CFM 8-9 x 9 Chicago T-S Steam
219 CFM Worthington (GAS or Diesel) Portable
214 CFM 9 x 9 Chicago T-B, 30-40 HP—Elec.
211 CFM 9 x 9 Ingersoll ES, 30-40 HP—Elec.
270 CFM 10 x 11 American 50 HP—Elec.
284 CFM Worthington Semi-Portable, 50 HP
315 CFM Worthington (GAS or Diesel) Portable
388 CFM Worthington Semi-Portable, 75 HP
460 CFM 13/9 x 10 Chicago O-CB Duplex, 75 HP Elec.
500 CFM Worthington (DIESEL) Portable
552 CFM 13/9 x 10 Chicago O-CB Duplex, 100 HP Elec.
600 CFM Worthington (DIESEL) Portable
720 CFM 18 x 7 Worthington HBV Vacuum Pump 25 HP
1184 CFM 22 x 9 Chicago T-VB Vacuum Pump 40 HP
1633 CFM 24 x 11 Chicago T-VB Vacuum Pump 60 HP

Quality Rebuilts by American
5 CFM to 5000 CFM—5 Lbs. to 3000 Lbs.

American
AIR COMPRESSOR CORP.
DELL AVE & 48th ST. NORTH BERGEN, N. J.
Telephone UNion 5-4848

FOR SALE

Bucyrus-Erie 120-B

ELECTRIC DRAGLINE

Mounted on caterpillars; 100 foot boom; 4¾ cubic yard bucket. Has recently been reconditioned and in excellent condition, has been used mostly for rehandle. Reason for Sale: Less rehandle in new coal pits and have two other machines. Specifications and photographs sent on request.

NORTHWESTERN IMPROVEMENT CO.
Colstrip, Montana

Eveready has

• BOATS
• CRANES
• DREDGES
• SHOVELS
• STORAGE TANKS

Construction Equipment. All late type.
Contact us for your needs.
Eveready, 805 Housatonic Ave, Bridgeport, Conn.

FOR SALE

3 Cubic Yard

BURMEISTER MIXER

Hydraulic controlled, powered with two—20 HP geared motors complete with switches. Good as new. Used less than 5 months.

FUCHS-CLAYTON MACHINERY COMPANY
Omaha, Nebraska

BURLAP

Concrete Curing Pads
Concrete Curing Sheets
Burlap Bags Cement Bags
Double Loop Bar or Bag Ties
Temporary Tarpaulins

ATLANTIC BAG COMPANY
429 South 5th Street Brooklyn 11, New York
EVergreen 8-4828

FOR SALE

SIMPLICITY DRYER and DUST COLLECTION SYSTEM

Two-compartment Feeder
Cold Elevator
Dryer 10' diameter x 20' long
#12 Ray Burner
UD18A International Power Unit for Dryer
Dust collecting system includes large Claradge exhauster fan and UD18A International Power Unit

Equipment in excellent condition, rebuilt in 1954, priced to sell.

TRI-STATE EQUIPMENT CO. INC.
520 So. Mulberry Memphis, Tenn.
5-3716

FOR SALE

P & H model 1055 3½ YD. SHOVEL

Powered by diesel engine, machine is in excellent condition. PRICE $27,300.00
(Will consider rental purchase sale in New Jersey, Maryland, New York and Penna.)

WILLIAM LUBRECHT, III
311 W. Diamond Ave. Hazleton, Penna.
Phone Gladstone 5-4041

DIESEL GENERATORS

3—62.5 KVA Cummins sets, 220 v., 3 ph., 60 cy., also Cummins Diesel engine 65 HP, HIP 600, Cummins Diesel engine model H-600, rocker shovels, rail, rock drills.

MINERVA OIL CO. Eldorado, Ill.

RAILS-TIES

TRACK ACCESSORIES

NEW and RELAYING

RAILS

FOR IMMEDIATE DELIVERY

500 Tons 80# ASCE Relay
400 Tons 90# ARA-B Relay
150 Tons 90# ASCE Relay

TIE PLATES • Excellent Relay
TURNOUTS — LIGHT RAILS
TRACK ACCESSORIES

MORRISON
RAILWAY SUPPLY CORP.
814 Rand Bldg. Buffalo 3, N. Y.
MOhawk 5820

NEW—RAILS—Relayers

All sizes and weights. Also frogs, switches, spikes, bolts, tie plates, contractors' and mine equipment carried in stock.

M. K. FRANK
480 Lexington Ave. Park Bldg.
New York, N. Y. Pittsburgh, Pa.
Reno, Nevada Carnegie, Pa.

RAILROAD Cross and Switch **TIES**

Promptly from adequate stocks
NEW and USED *(as available)*

GILLIS & COMPANY
29 East Madison St. Chicago 2

RAILS

NEW — RELAYING — TRACK ACCESSORIES

• • MIDWEST STEEL CORP.
502 DAYDEN STREET
CHARLESTON, W. VA.

IMMEDIATE DELIVERY

LOW COST INSTALLATION AND OPERATION

CABLEWAYS

IMMEDIATE SHIPMENT
ELECTRIC, STEAM OR DIESEL
CAPACITY 5 TO 20 TONS
SELL, RENT OR BUY

FOR DAMS BRIDGES BREAKWATERS FILTRATION AND SEWERAGE PLANTS

FOR SPEED ECONOMY EFFICIENCY FLOOD SAFETY LABOR REDUCTION

AMBURSEN DAM CO. INC.
295 MADISON AVE NEW YORK

SEARCHLIGHT SECTION

This index is published as a convenience to the reader. Every care is taken to make it accurate but SEARCHLIGHT SECTION assumes no responsibility for errors or omissions.

Aberthaw Company 138
Albeni Constructors 139
Albert Pipe Supply Co., Inc. 139
Ambursen Dam Co. 140
American Air Compressor Corp. 140
Arabian American Oil Co. 133
Atlantic Bag Company 140

Bass Engrg. & Constr. Co. 138
Boers Equipment Co., Gil 138
Boyer, R. H. 136
Buff 138

Carlyle Rubber Co., Inc. 136
Charter Oak Construction Co., Inc. 136
Cleveland Quarries Co. 134
Colonial Williamsburg Inc. 133
Contractors Machinery Co. 137, 141
Corson Inc., G & H 138
Cramer-Voll Marhausen Co., Inc. 136

Deatherage & Son, George E. 134
Dougherty Co., A. L. 137
Drachman Steel Co., Inc. 139

Eveready Supply Co. 140

Forsythe Equipment Co., Inc. 136, 138
Foster Co., L. B. 141
Frank, M. K. 140
Frazier-Davis Construction Machinery Co. 137, 139
Fuchs-Clayton Machinery Co. 140

Gannett Fleming Corddry & Carpenter Co. 133
Gillis & Co. 140
Glazer Steel Corp. 134
Greenpoint Iron & Pipe Co. 139
Greensburg Machine Co. 136

Hickerson, Roy D. 138
Holbrook, John C. 139
Hughes Bros. 138

Jaeger-Lembo Machine Co. 135

Lubrecht, III, William 140

McGlone Construction Co., Perry 135
Mertes Machinery Co. 136
Midwest Steel Corp. 140
Mississippi Valley Appraisal Co. 140
Mississippi Valley Equipment 136, 141
Morrison Railway Supply Co. 140

National Blue Print Co. 138
Northwestern Improvement Co. 140

Perini & Sons Inc. 134

Schoonmaker Co., Inc., A. G. 136
Sherman Transfer Co., Roger 135
Stanhope Inc., R. C. 141

Tagco Inc. 139
Tamblyn System 134
Tennessee Valley Authority 135
Torson Construction Co. 139
Tri-State Equipment Co., Inc. 140

Warren-Knight Co. 138
Weiss Co., B. M. 136
White Co., David 138
Williams Construction Co. 139
Wilson Engineering Co. 134

PROFESSIONAL SERVICES

NEW ENGLAND

Engineering Services Inc.

Foundation Investigations,
Soil Testing & Test Borings
Minerals Exploratory
Service

56 Harlan St., Manchester, Conn.

Jackson & Moreland

Engineers and Consultants

Design and Supervision of Construction
Reports—Examinations—Appraisals
Machine Design—Technical Publications

Boston New York

Metcalf & Eddy

ENGINEERS

Investigations Reports Design
Supervision of Construction
and Operation
Management Valuation Laboratory

1300 Statler Building, Boston 16

MIDDLE ATLANTIC

Edwards, Kelcey & Beck

Reports, Design Supervision, Expressways, Port & Harbor Works, Terminals, Tunnels, Bridges, Water Supply, Industrial Plants, Traffic and Management Studies.

3 William Street Newark 2, N. J.
New York Boston Philadelphia

Porter, Urquhart & Beavin

O. J. Porter & Co.
Consulting Engineers
Airports-Highways-Dams-Structures
Foundations-Stabilization-Pavements
415 Frelinghuysen Ave., Newark 5, N.J.
76 Ninth Ave., New York 11, N. Y.
3568West Third St., Los Angeles 5, Calif.
516 Ninth St., Sacramento 14, Calif.

When you need a SPECIALIST in a hurry . . .

Engineering News-Record's Professional Service Section offers the quickest, most direct method of contacting consultants who may be available NOW.

Engineering Corporation Of America

Chemical & Petro-Chem Process Plants
Industrial Waste Treatment Projects
Air Pollution Abatement
Special Mechanical & Process Equipment

207 Grove Street Westfield, N. J.
Westfield 2-7117

Ammann & Whitney

Consulting Engineers

Design — Construction Supervision
Bridges, Buildings, Industrial Plants,
Special Structures, Foundations,
Airport Facilities, Expressways.
76 Ninth Avenue, New York 11, N. Y.
724 E Mason Street, Milwaukee 2, Wis.

E. Lionel Pavlo

Consulting Engineer

Design, Supervision, Reports,
Bridges, Highways, Expressways,
Marine Structures, Public Works,
Industrial Construction and Airports

7 E. 47th St. New York 17, N. Y.

Preload Engineers Inc.

Founded - 1934

Consultants in Prestressed Design

Designers of more than 800 prestressed concrete bridges, buildings, tanks and high pressure pipe lines erected in North America since 1934.

Curson Dobell *B. H. Thwaits*
Eric Molke *Cedric Steiner*

955 North Monroe Street, Arlington, Va.

Severud-Elstad-Krueger

Consulting Engineers

Structural Design - Supervision
Reports - Buildings - Airports
Special Structures

415 Lexington Avenue
New York 17, N. Y.

D. B. Steinman

Consulting Engineer

BRIDGES

Design, Construction
Strengthening, Investigations,
Reports, Advisory Service

117 Liberty St., New York 6, N. Y.

Frederick H. Dechant

Consulting Engineer
Chairman of the Board,
Frederic R. Harris Inc.
Water Works, Industrial Wastes, Sewerage, Recovery Processes, Hydraulic Works, Gas Plants
Phila.: Fidelity Phila. Trust Bldg.
New York: 27 William St

Michael Baker, Jr., Inc.

Consulting Engineers

Civil Engineers, Planners, Surveyors; Airports, Highways, Water & Sewerage Design; Aerial Topographic Maps; Dams; Irrigation; Reports; All types surveys. Home Office: Rochester, Pa.; Branch Offices: Jackson, Miss., Harrisburg, Pa.

Airways Engineering Corp.

Airports, highways, dams, fuel storage, pipe lines, photogrammetry.
1212 - 18th St., N.W.,
Washington 6, D. C.
Phone: REpublic 7-8131.

SOUTH

Duval Engineering & Contracting Co.

General Contractors

FOUNDATION BORINGS
For Engineers and Architects.

Jacksonville, Florida

Rader Engineering Co.

Water Works, Sewers, Refuse Disposal, Ports, Harbors, Flood Control, Bridges, Tunnels, Highways, Airports, Traffic, Foundations, Buildings, Reports, Investigations, Consultations.

111 N.E. 2nd Ave., Miami 32, Florida

MIDDLE WEST

Consoer, Townsend & Associates

Water Supply, Sewerage, Flood Control & Drainage, Bridges, Express Highways, Paving, Power Plants, Appraisals, Reports, Traffic Studies, Airports, Gas & Electric Transmission Lines.

351 East Ohio St., Chicago 11, Illinois

Harza Engineering Co.

Consulting Engineers

Calvin V. Davis E. Montford Fucik
Richard D. Harza
Hydroelectric Plants and Dams
Transmission Lines
Flood Control, Irrigation
River Basin Development
400 West Madison Street Chicago 6

GEOLOGISTS

Geologic Associates

ENGINEERING GEOLOGISTS

Studies and Reports
Foundation Investigations
Specialized Drilling and Sampling

P.O. Box 8096 — Nashville, Tenn.
9-1519 Phones 8-4061

INSPECTION & TEST

Johnson Soils Engineering Laboratory

Engineering design and construction tests run from MOBILE LABORATORY UNITS at construction site. Field load bearing tests.

193 West Shore Ave., Bogota, N. J.
Bogota-Hubbard 7-4408

Consult these Specialists:

Let them save your time by bringing their broad experience in their specialty to bear on your problems.

SEARCHLIGHT SECTION

PILING

SURPLUS NEW and USED For Sale or Rent

RENT STEEL SHEET PILING

Get the exact lengths and sections you need from Foster—all standard makes, delivered *on time*—and at Foster's standard low rental rates. Also Rental Pile Hammers & Extractors.

L.B. FOSTER CO.
PITTSBURGH 30 • NEW YORK 7 • CHICAGO 4
HOUSTON 2 • LOS ANGELES 5

S.S. PILING & EQUIPMENT

892 PCS. BETH. DP-2—20, 40, 45 & 60 FT.
454 PCS. BETH. AP-3—15, 20, 50 & 60 FT.
101 PCS. LARSSEN II, 60 FT. 26 LB.
5-5 McK. TERRY HAMMER, SAND DRAIN.
38 TON CAP. P & H 855-B, 110 FT. BOOM CRANE.

STANHOPE, 60 E. 42nd St., N. Y. 17, N. Y.

We do a Nation-Wide business in

STEEL SHEET PILING

IMMEDIATE SHIPMENT

1200 pcs. 72-16 ft. Carn. MP-101—West Coast
428 pcs. 60-50 ft. M-116 & M-115—Illinois
380 pcs. 60-30 ft. DP-2 & AP-3—New York
280 pcs. 35-30 ft. Inland 1-27—Mississippi
218 pcs. 30 ft. Carn. M-116—Iowa
180 pcs. 32-28 ft. Inland 1-23—Georgia
113 pcs. 20 ft. Carn. M-116—South Carolina

Other lengths & sections used & new at other locations in United States

We have Nation-wide reputation for effecting QUICKEST SHIPMENTS

All sizes Vulcan & McKiernan Pile Hammers & Extractors for rent—Shop Rebuilt

Regardless of location of job, Wire, Write, or Phone

MISSISSIPPI VALLEY EQUIPMENT CO.
509 Locust St., Chestnut 1-4474 St. Louis, Mo.

STEEL SHEET PILING

150—Pcs. M-116	in 60'	—Chicago
55—Pcs. I-27	in 32 to 34'	—Missouri
190—Pcs. M-116	in 25 to 35'	—Nebraska
100—Pcs. I-27	in 27 to 35'	—Kansas City
125—Pcs. M-116	in 27 to 30'	—Kansas
83—Pcs. M-112	in 25 to 65'	—North Dakota
80—Pcs. M-116	in 25 to 30'	—Iowa
80—Pcs. I-27	in 25 to 29'	—Nebraska
900—Pcs. I-23	in 15'	—Illinois
170—Pcs. I-23	in 13 to 16'	—Nebraska

Available for Prompt Shipment
Other Lots at Various Locations

CONTRACTORS MACHINERY CO.
Phone: VAlentine 4750
2617 SOUTHWEST BLVD
KANSAS CITY 8, MO.

Makes Big Cuts FAST

MARION 111-M

You make "big cuts" two ways when a MARION 111-M shovel moves on the job.

Big yardage jobs move quickly for the 111-M. Its diesel power is balanced with extra heavy design and oonstruction. Gentle air controls put this big machine into action with fingertip pressure.

There's a big cut, too, in excavation costs, for many reasons. One is the electric swing on the 111-M diesel that results in faster cycle time and accurate spotting of the load without worry about overheated swing clutches.

Get the full story on these and other benefits that become yours when you own a MARION 111-M—write us today for Bulletin 402-A.

MARION POWER SHOVEL CO.
MARION, OHIO, U. S. A.

70 YEARS OF PROGRESS

from ¾ cu. yd. to 45 cu. yds.

OFFICES AND WAREHOUSES IN ALL PRINCIPAL CITIES

PROVING GROUND for the new belt is this heavy cone crusher.

Belt drive thrives on shock loads

Flat belts and single and multiple V-belts have proved their utility many times over, but now a new type of belt drive has been designed to combine the simplicity and ruggedness of flat belts with the grip of V-belts.

Known as Poly-V, the new drive is a single, endless rubber belt with a series of parallel V-shaped ribs molded lengthwise around the inside circumference. Internal reinforcing is supplied by synthetic fiber cords while a rubber-impregnated fabric covering provides protection against abrasion.

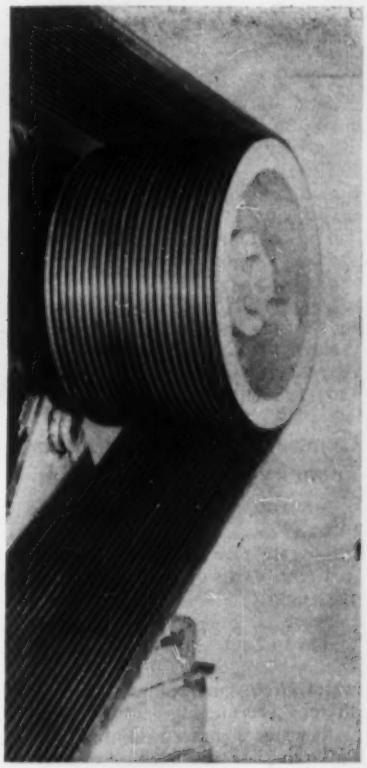
The drive—like a flat belt—uses sheaves of unit construction; however these sheaves are machined with V-grooves designed to mate precisely with the belt ribs. Since the belt covers the full width of the drive member, the load is distributed equally over the entire driving surface. This provides twice the contact area of a comparable V-belt application, and thus it is claimed that Poly-V gives up to 50 percent greater horsepower with the same width drive or equal horsepower with ¼ less width.

A claim of longer belt life is filed since the design features of the Poly-V drive reduce face pressure one half. Further, because the belt extends the full-width of the drive and maintains traction over the full contact surface it is said to prevent belt turnover or sinking into the grooves because of wear or shock loads.

Equipment owners and maintenance men will appreciate the reduced inventory made possible by the new drive. Only two cross-sectional sizes are required, #187 and #375—multiple V-belts are made in five section sizes. Also, wide belts can be tailored to fit narrower sheaves by slitting with a knife. Belt lengths will, of course, remain predetermined.

The new drive has been in use for some time and has proved its superiority over usual types for many applications. Among these is that pictured above. Here, a secondary cone crusher operated by the New Haven Trap Rock Co.'s Plainville, Conn., plant was equipped with a #375—the larger of the two sizes—Poly-V drive. Installation of the new development permitted narrower sheaves and eliminated the matching problems of comparable multiple V-belt drives. The crusher operates 8 to 10 hours a day during the season at a capacity of 250 tons per hour; and under the abrasive and shock loading conditions normally encountered in such situations, the belt is reported to be functioning very well.

In another case, a major manufacturer of crawler tractors has been testing a #187 Poly-V drive on a 27-hp diesel fan-generator drive in Arizona. Operating at 1,375 rpm, the 1⅞-in. wide Poly-V belt lasted 1,227 hrs as compared with 522 hrs for multiple V-belts. In addition, the Poly-V sheaves lasted 3,162 hrs before replacement as compared with approximately 1,400 hrs for the usual drives. These factors, as well as the low operating temperature of the drive, have prompted further testing. MANHATTAN RUBBER DIV., RAYBESTOS-MANHATTAN, INC., PASSAIC, N. J.



V-SHAPED RIBS match machined grooves in drive sheaves.

Water, sewage treatment simplified with telemeter

The Autocon Telestep is said to be the first telemetering system designed exclusively for the automatic remote control of municipal and industrial water and sewage equipment. It is designed to provide transmission of up to 60 signals in either direction between outlying reservoirs, treatment basins and central control centers.

The signals can be sent automatically as required by a system to operate a number of devices, to report that such devices are operating and to sound an alarm in the event of malfunction or the approach of a dangerous condition. The transmission setup also can give temperature or pressure readings on a continuous basis and hence can be recorded.

The Telestep control uses float, pressure, bubbler or probe sensing de-

(*Continued on page 144*)

vices to sense and report conditions at various points. These sensations are then transmitted electrically over a pair of #26 or larger wires. Leased telephone wires or private cables are used normally.

The features claimed for the system include simplicity of installation and operation, easy maintenance through use of basic components and circuits and the transmission of multiple continuous proportional signals as well as multiple control signals.

The transmitter has pilot lights for showing "action-called-for" for each of the control signal circuits. The transmitter and all receivers have pilot lights for showing "action accomplished" for each of the reporting control circuits. AUTOMATIC CONTROL CO., 995 UNIVERSITY AVE., ST. PAUL 4, MINN.

Concrete plant water meter capacity raised to 300 gpm

Automatic control of water in ready-mix and block batches is now available for higher water delivery rates up to 300 gpm. This control is provided by the new 3-in. Neptune Auto-Stop meter.

The meter features a cushioned stop that slows down the rapid flow of water an instant before it trips shut, thereby permitting accurate cut-off with water hammer minimized.

To operate, the tripping mechanism is first set by pushing buttons which actuate a cylindrical dial. When the number of gallons of water required is shown, the main register is cleared and the valve opened. The meter shuts off automatically when the gallonage set on the dial is equal to that recorded on the main register.

Flow can be stopped by pressing an emergency stop and then continued without alteration of settings to its conclusion, or the register can be reset for a new quantity before continuing. NEPTUNE METER CO., 50 W. 50TH ST., NEW YORK 20, N. Y.

Pint-sized water cooler has 10-gal per hr capacity

A bantam-sized water cooler that stands only 30 in. off the floor has been designed for use in schools, churches, parks, camps and other places catering to youngsters.

Called the Oasis Juvenile, the new model will take a remote fountain and/or glass filler attachment. The unit also includes a standard precooler and 5-qt reserve storage tank plus a ⅛-hp compressor. THE EBCO MFG. CO., 401 WEST TOWN ST., COLUMBUS 8, OHIO.

Magnetic meter reader prints record on tape

Dirty faces or condensed moisture under the dial glass need not bar accurate reading of water meters. A new head combined with a recording mechanism is said to provide fast, accurate readings that are printed indelibly on tape even if the meter is submerged.

The special head is installed with the aid of an adapter plate after the ordinary register and head are removed. This special unit is contained in a brass case under slight oil pressure and therefore is shatterproof, dirtproof and virtually unbreakable.

To take a reading, the routeman locks the recording mechanism over the meter head, pushes a plunger and a reading is automatically printed and recorded on a paper tape along with the serial number of the meter. An automatic spacer moves the paper into position for the next reading.

After covering his route, the meter reader returns the recorder to his supervisor who unlocks the instrument and removes the paper tape. The tape is then forwarded to the billing department for appropriate action. MAGNAMATIC CORP. OF AMERICA, 803 N. MAIN AVE., SAN ANTONIO, TEX.

Hydrohoe now has wrist-action dipper

A new attachment has been developed to increase the speed and utility of the Model H-3 Bucyrus-Erie Hydrohoe—all-hydraulic back hoe.

The attachment is a dipper that rotates in a vertical plane through an arc of 65 deg from a position of 25 deg ahead of the handle and 40 deg behind it.

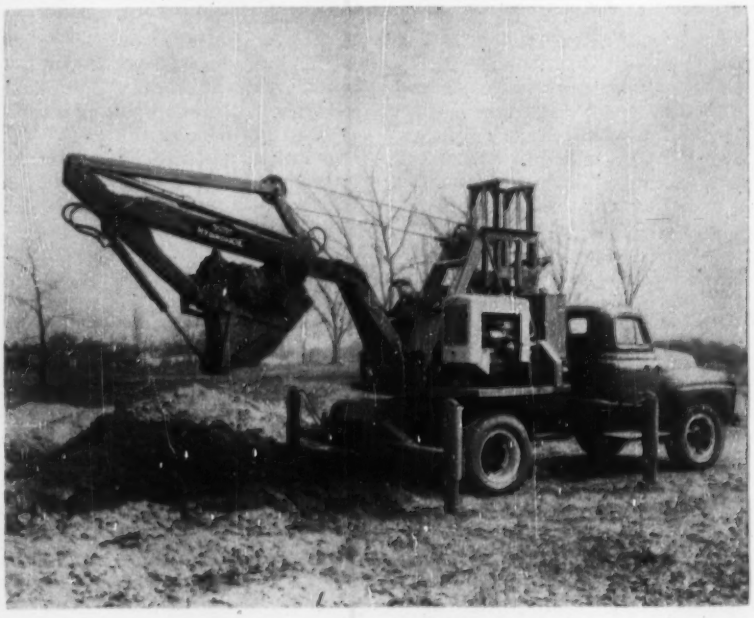
When the dipper is rotated simultaneously with the extension of the digging ram, the combined effort is said to produce about 38 hp at the dipper teeth with up to 6 tons of force exerted. The wrist-action dipper is also reported to lessen spillage and improve the range for clean dumping into trucks. It can dig vertical and undercut walls deeper than they are long.

In addition, the operator can change the pitch or rake of the dipper teeth during the digging arc to secure the best digging angle. The hydraulic ram powering the wrist-action is driven by a pump that normally supplies the swing bank.

In place of the hydraulically operated earth ejector, the wrist-action dipper is arranged for automatic ejection. A stationary blade or door (optional) around which the dipper rotates ejects the sticky material.

The Hydrohoe, with or without the wrist-action dipper, is offered either as a complete machine or as an attachment for current H-3 Hydrocranes. Earlier models can be modified to incorporate the new attachment. BUCYRUS-ERIE CO., S. MILWAUKEE, WIS.

(Continued on page 147)



In a variety of corrosive services

BYERS WROUGHT IRON

serves longer at lower cost per year

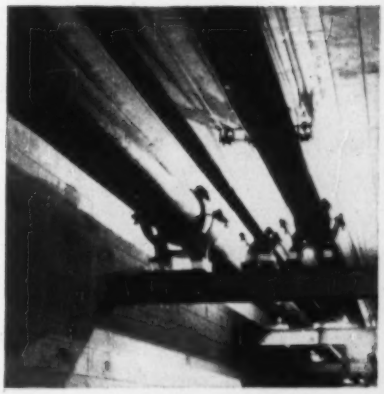
The true cost picture isn't given by construction costs alone. It must include *maintenance* costs also . . . and when these are included, the most durable materials have proved themselves as the most economical.

You'll find Byers Wrought Iron Pipe and plate the best material to use when you are building for permanence. The illustrations show a few of the many applications where it is serving successfully for others . . . and where it can serve and save for you. The use of wrought iron *adds only a trifle to the overall cost* of a project, and this small investment is returned many times over in extra service.

Wrought iron lasts longer, at lower cost per year because of its unique structure which resists corrosion and fatigue. Tiny fibers of glass-like iron silicate, distributed through the body of high-purity iron, halt and detour corrosive attack, discourage pitting and rapid penetration. These fibers also anchor the initial protective scale, which shields the underlying metal.

Our booklet, *The ABC's of Wrought Iron,* tells the story of this protection, and how it is bringing piping economy to a variety of applications where corrosion is a threat. Write for your copy.

A. M. Byers Company, Pittsburgh, Pa. Established 1864. Boston, New York, Philadelphia, Washington, Atlanta, Chicago, St. Louis, Houston, San Francisco. Export Department: New York, N.Y.



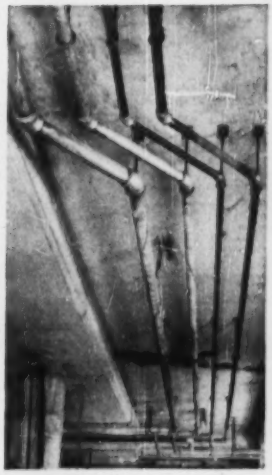
HEATING LINES

UNDERGROUND LINES

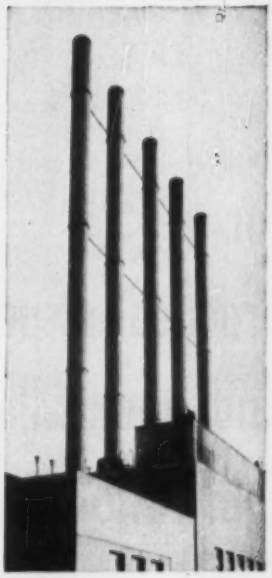
ICE RINKS

WATER WORKS, SEWAGE

SNOW MELTING, RADIANT HEATING



PLUMBING LINES



STACKS, BREECHINGS

AIR CONDITIONING SYSTEMS

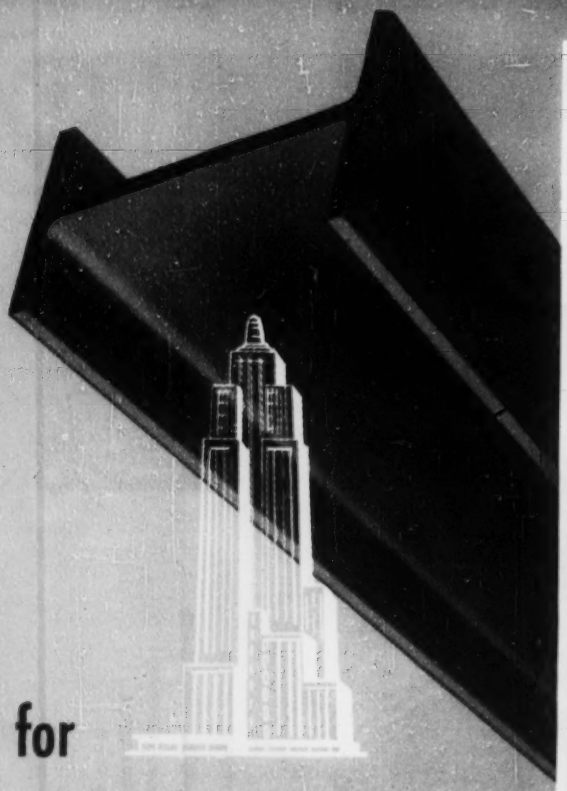
BYERS

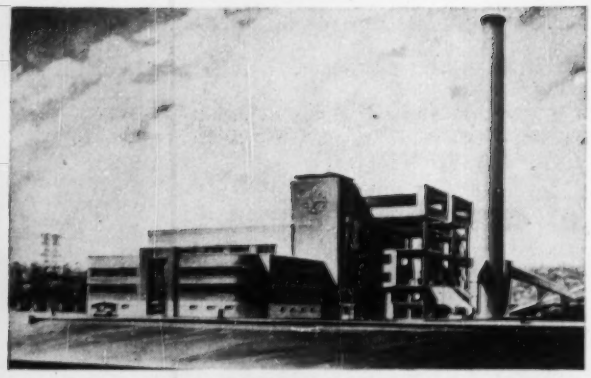
CORROSION COSTS YOU MORE THAN WROUGHT IRON

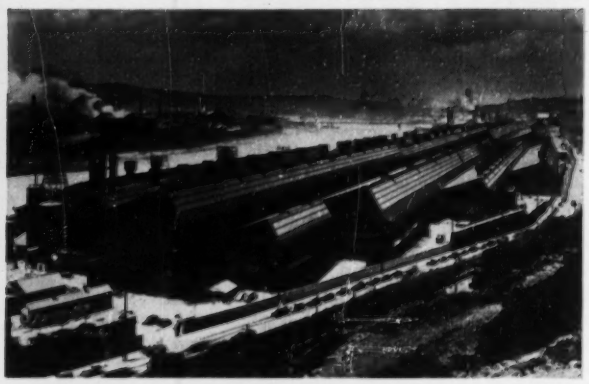
WROUGHT IRON

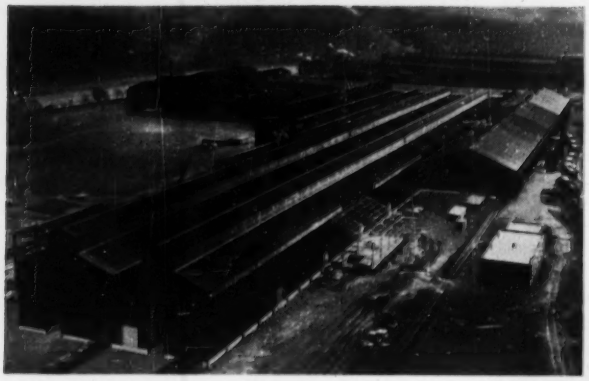
TUBULAR AND HOT ROLLED PRODUCTS

ELECTRIC FURNACE QUALITY STEEL PRODUCTS









for
practical experience
and unexcelled
fabrication facilities

Consult **FORT PITT**

Specialists in the fabrication and erection of structural steel for steel mill buildings, power plants, assembly and warehouse units, office and commercial structures, institutions,—bridges of all types. ● Let us work with you on your next structural steel project.

"There is no substitute for structural steel"

Steel permits Streamlining Construction with Safety, Endurance and Economy

AISC — American Institute of Steel Construction, Inc. — Founded 1921

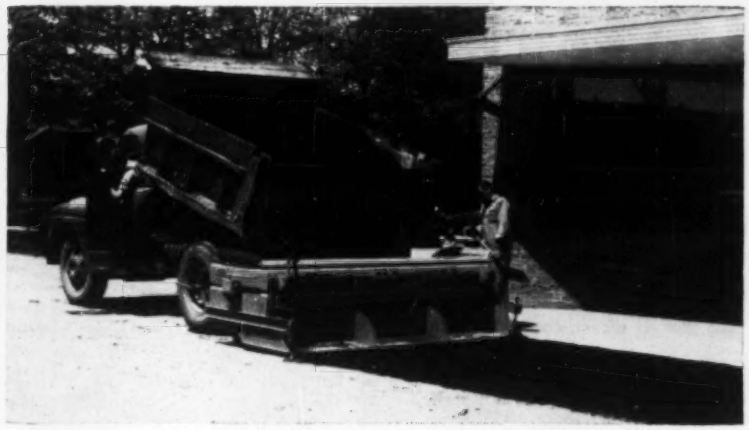
Fort Pitt **BRIDGE WORKS**

Member American Institute of Steel Construction

General Offices: Pittsburgh, Pa. Plant at Canonsburg, Pa.

District Offices

NEW YORK, N. Y. CLEVELAND, OHIO DETROIT, MICHIGAN



Spreader designed for small jobs

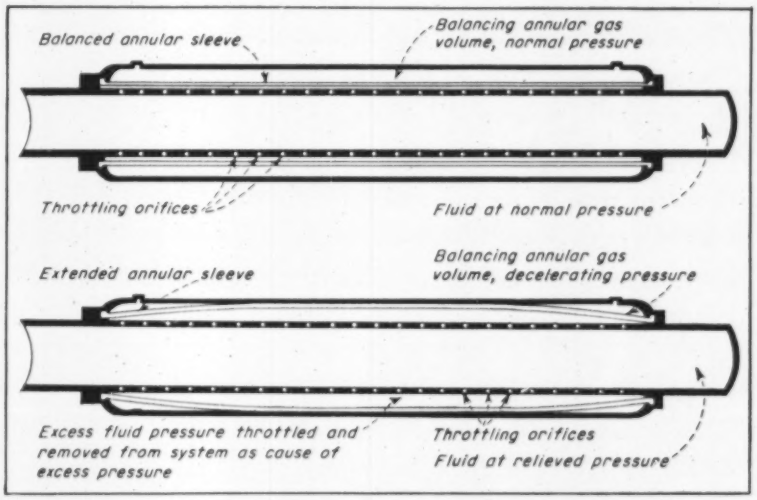
A new low-cost towed-type spreader has been designed for applying bituminous concrete and aggregate to driveways, parking lots, tennis courts, alleys, etc.

The new unit features a staggered wheel arrangement consisting of ten pneumatic tired wheels that are said to keep the spreader on an even keel at all times to maintain a level finish course. The screed is adjustable for height by dual controls at each end to permit spreading depths from ½ to 8 in. It handles rock up to 4 in. in size for base course.

The shutoff gate is hydraulically operated to allow the operator to start or stop the flow of material from the hopper and eliminates dribbling at the beginning and end of each strip. Cutoff runners on each side are said to form sharp, untapered outside edges, and since there are no wheels outside the hopper, it is possible to spread material close to buildings and curbs.

Simple truck hitches are reported to be easily installed and removed and the spreader is automatically coupled to them. For travel between jobs the equipment can be chained to a dump body and hoisted off the ground by one man.

Four sizes are available, 8, 9, 10 and 12-foot spreading widths with cutoff plates to adjust width of spread. Motor driven auger-type agitators are available in the two larger sizes to even out the spreading action. Highway Equip. Co., Cedar Rapids, Iowa.


Balanced annular sleeve
Balancing annular gas volume, normal pressure
Throttling orifices
Fluid at normal pressure
Extended annular sleeve
Balancing annular gas volume, decelerating pressure
Excess fluid pressure throttled and removed from system as cause of excess pressure
Throttling orifices
Fluid at relieved pressure

Desurger minimizes line shock

A new type of desurger has been designed for installation in any fluid piping system to reduce the shock or "hammer" when a valve is closed against a moving column of liquid.

The device is a through-flow, in line, dual-acting pulsation dampener. It is designed to allow fluid flow with accumulation and discharge of excess pressures through throttling orifices of a calculated number and size so that the pressure surges are broken up and dissipated.

In cases of unusually dangerous or damaging variation in operating pressures, it is possible to use two desurgers in tandem—one is loaded for low pressure and the other for high pressure operation. George E. Failing Co., Enid, Okla.

V-6 diesel designed for Page walking draglines

A new compact V-6 horizontal diesel engine is now being built to provide power to the load and hoist drums of Page walking draglines. Its horizontal design is said to give quick access to all major parts of the engine from above, thereby reducing any necessary inspection and maintenance time.

By removing the crankcase cover, the pistons and connecting rods are exposed and can be removed without disturbing the cylinder heads or the short, rigid crankshaft. Valves can be adjusted individually and timed from the head end; cylinder heads can also be removed individually, as a feature of the new engine.

To reduce inventory requirements, virtually all parts of the new engine are interchangeable with the 3-cyl diesel used to drive the generator for the swing motors on the company's draglines. Except for the engine frame, camshaft, crankshaft and timing gears, the engines differ only in the number of cylinders, the manufacturer reports.

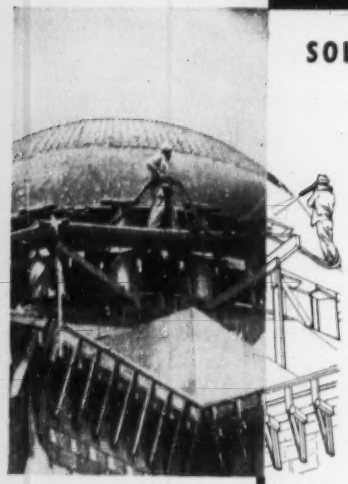
To meet the power requirements of the various size Page draglines, the engine is available in two sizes with bore and stroke measurements of 12½ x 16 in. and 11 x 15.

Prototype models of the new diesels have been used to supply current at the manufacturer's plant since 1948. Two 600-hp engines act as prime movers for two generators with 750-kw combined capacity and carry an average load of 350 to 400 amps 8 to 17 hrs daily. Page Engineering Co., Clearing Post Office, Chicago 38, Ill.

(*New Products continued on page* 148)

"GUNITE"

SOLVES STRUCTURAL PROBLEMS



Tough, versatile, durable for difficult construction and restoration. "GUNITE" –pneumatically applied sand and cement –is placed direct, conforms to any shape specified. Get "GUNITE"—the most practical construction material since 1912—adapted to your toughest problems by "GUNITE" Associates, Inc.

"GUNITE" ASSOCIATES, INC.

GUARANTEED PERFORMANCE THROUGHOUT THE SOUTH

Miami, Florida
7541 N.E. 3rd Place

Atlanta, Georgia
1013 Boulder crest Dr., S.E.

Affiliate of BAILEY-LEWIS-WILLIAMS

With Responsibility Undivided

• From exploration to installing Layne equipment in a Layne drilled well, Layne service is complete and offers undivided responsibility. On any phase of ground water development informed engineers know through experience — it is wise to first consult Layne.

LAYNE & BOWLER, INC.
Memphis, Tenn.

Associate Companies Throughout the World

closing up all the joints

between strips of the smooth
BITUMINOUS SURFACE

is just 1 feature of the B-G FINISHER

to learn about other advantages send for
THIS FREE BOOK

see your B-G distributor or write
Barber-Greene
AURORA, ILLINOIS, U.S.A.

NEW PRODUCTS

Luminaire designed for latest 6-ft street lamps

A new four-lamp fluorescent luminaire for street lighting systems, designed for mounting at 25 ft or higher, accommodates the latest approved 6-ft street lighting lamps. The luminaire is claimed to approach a Type III of Type IV distribution pattern.

All metallic parts of the luminaire are cast or sheet aluminum; covers are translucent plastic. Hinged at the top and latched at the bottom, the covers are designed to facilitate relamping and maintenance. Gaskets are said to make the luminaire weatherproof and bug-proof.

A mounting bracket incorporates a 5-deg from horizontal leveling feature, and also allows the luminaire to be tilted up to 20 deg from horizontal so that the balance between building front and road surface lighting may be changed. LINE MATERIAL CO., MILWAUKEE 1, WIS.

New products briefs . . .

• **Air-conditioning door**—A new 1¾-in. steel flush interior door developed expressly for use in centrally air conditioned and perimeter heated homes has been developed by the Building Products division of the American Welding & Mfg. Co., Warren, Ohio. Designed to allow the proper air flow between connecting rooms as required by central air conditioning installations, the door is said to permit closed-door privacy without impairing or disturbing the heat balance of the system and eliminates the need for return air ducts. Five standard sizes are available from 2 ft by 6 ft 8 in. to 3 ft by 6 ft 8 in. with effective grille areas of 89 sq in. to 136 sq in., respectively. Panels are reinforced at approximately 17-in. centers alternating on front and rear panels. An emulsion-type coating applied to the inside of the panels, bonded permanently to the parent metal, provides sound-deadening qualities.

• **Marking pen**—A new marking pen, named Tech-Pen, is said to write clearly on any surface with brilliant, opaque, quick-drying ink, and there are no felt tips or other parts to dry up or require replacement. The pen comes with a supply of its own special ink in red, green, yellow, blue, black or white and with each pen an extra ink supply is included. Price of the pen is $4 and it is available from the Mark-Tex Corp., Dept. 37, 453 W. 17th St., New York 11, N. Y.

• **Crane boom safety**—The Rud-O-Matic Thomas boomstop reportedly prevents boom kinking and twisting by automatically cutting off power the moment the boom is raised too high. Entire operation is automatic; no adjustments are necessary. Two models are available from the manufacturer, McCaffrey-Ruddock Tagline Corp., 2131 E. 25th St., Los Angeles 58, Calif.; Model 5000 for small cranes up to 20-ton capacity; and Model 10,000 for cranes from 20-ton to 100-ton capacity. Dual spring-loaded rams, mounted on the "A" frame or gantry of the crane, provide a soft, cushioning effect, and arrest boom movement when a load cuts loose and boom whips back. Rams prevent boom from being raised too high.

• **Drawing ink**—An extra dense black ink has been developed by Artone Color Corp., 21 W. Third St., New York, N. Y., to meet the need for extremely dense covering power and free flowing quality in black ink required by most architects and engineers. Extra dense black is said to cover large areas without streaking, dries rapidly, and can be used either in a pen or with a brush and results in a smooth no-gloss mat finish.

• **Rubber hose valve**—The Camac hose valve manufactured by Carl Buck & Associates, Essex Fells, N. J., has been designed to meet the need for a simple method of valving hose used for the transfer of corrosive liquids. It is said that because of the contoured design of the clamp faces the valve will not damage hose and will give a complete shut-off against pressures up to 100 psi. Light in weight, it places a minimum of drag on the hose. One-hand operation is possible and the valve may be put on or taken off hose runs without disturbing connections. The valves are suitable for use with hose from 1 in. to 2½ in. ID.

• **Compaction roller**—After subjecting ing it to actual field tests during the 1953 construction season, Rosco Mfg. Co., 3118 Snelling Ave., Minneapolis 6, Minn., has added the manufacture of multiple-wheel, pneumatic-tired rollers to its line of bituminous road and street equipment. This compaction roller known as Rosco-Pactor is being built in both 9 and 13-wheel types. The 13-wheel model weighs 3,700 lb and provides a compaction path of 84 in. The 9-wheel model weighs 2,820 lb; compaction path is 60 in. Both models are 106-in. wheelbase with a loaded height of 44 in. and are built to a box length of 10 ft.

SEE RUST-OLEUM APPLIED
DIRECTLY OVER RUSTED SURFACES!
SEE PROOF OF PERFORMANCE! MAKE
THIS TEST UNDER YOUR OWN CONDITIONS!

See Rust-Oleum 769 Damp-Proof Red Primer applied over a rusted surface after scraping and wire-brushing to remove rust scale and loose rust in the Rust-Oleum *"rusted panel demonstration."* Rust-Oleum's specially-processed fish oil vehicle *penetrates* rust to bare metal . . . saving time, money, and metal!

Beautify as you protect with colorful Rust-Oleum finish coatings. Specify Rust-Oleum for new construction, maintenance, and re-modeling. See Sweet's for complete catalog and nearest Rust-Oleum Industrial Distributor, or attach coupon to your business letterhead.

There Is Only One Rust-Oleum. It Is Distinctive as Your Own Fingerprint.

Protects Tanks, Girders, Gutters, Metal Sash, Fences, Roofs, Machinery, Stacks, Pipes, etc.

RUST-OLEUM®

STOPS RUST!

Resists Rain, Sun, Fumes, Snow, Heat, Salt Water, Salt Air, etc.

See local classified telephone directory under Rust Preventives or Paints for nearest Rust-Oleum Industrial Distributor.

ATTACH TO YOUR BUSINESS LETTERHEAD AND MAIL TO: Rust-Oleum Corporation, 2698 Oakton Street, Evanston, Illinois

- ☐ Please Show Me the Rust-Oleum "Rusted Panel Demonstration."
- ☐ Test Application of Rust-Oleum Over Rusted Metal Surfaces in My Plant.
- ☐ Complete Literature with Color Chart.
- ☐ Nearest Rust-Oleum Industrial Distributor.

Power to spare!

It's there, with a Le Roi heavy-duty engine

A typical construction-machinery application — a Le Roi heavy-duty engine powering a Barber-Greene loader.

Le Roi's conservative rating puts plenty of power in reserve to handle the heavy loads

Le Roi builds *only* heavy-duty engines — specializes in licking the tough power jobs.

Le Roi valve-in-head engines are the most powerful in the medium-speed, heavy-duty class — yet they are compact, and call for relatively low investment. They have the weight and stamina it takes to stand the punishment handed out to field equipment. They have famous Le Roi advanced-design features that mean dependability, economy, and quick field maintenance.

That's why you find Le Roi engines on so many makes of oilfield equipment, construction equipment, industrial machinery, and agricultural equipment.

Look to Le Roi, for *your* power requirements. Le Roi is your best power buy—whether you're getting new equipment or replacement engines, or whether you're looking for an efficient power plant for the equipment you've designed. Le Roi has a full range of sizes from 15 to 635 hp. — for gasoline, natural gas, butane.

Write for latest bulletins.

LE ROI

LE ROI COMPANY

A Subsidiary of Westinghouse Air Brake Co. E-90

MILWAUKEE 14, WISCONSIN

Plants: Milwaukee • Cleveland — Greenwich — Dunkirk, Ohio • Coldwater, Michigan

PUBLICATIONS

Euclid catalogs—Two new 8-page catalogs cover the Euclid 17-yd. bottom dumps and the Euclid twin-power scrapers. The 17-yd. bottom dump catalog, No. 251, provides information by using many illustrations and a final specification page. The Euclid twin-power scraper is described in catalog No. 551. EUCLID DIV., GENERAL MOTORS CORP., CLEVELAND 17, OHIO

Front end loader—The Le Roi-Transo 1½-yd loader is featured in a new 8-page bulletin. Two pages of photographs are used to show the TLF-150 at work and another two pages are used to illustrate the design features of the machine. A section of the book is devoted to the TL-100, a 1-yd model, and another section gives complete specifications on both sizes of units. LE ROI CO, 1706 S. 68TH ST., MILWAUKEE 14, WIS.

Stone cleaning—The maintenance and restoration of a stone structure is the subject of a new 8-page folder describing a new wet-aggregate cleaning process and restoration service. The process, described as a scouring action obtained by the simultaneous application of water and a soft, friable aggregate, is said to restore stone structures without damaging the face of the stone. The new process is compared with five other standard methods. WESTERN WATERPROOFING CO., INC., 1220-27 SYNDICATE TRUST BLDG., ST. LOUIS 1, MO.

Water systems and pumps—The new 96-page "Commercial Catalog C-54" gives data, construction details, and selection tables on twelve types of Deming water systems including dual-purpose jet pumps and submersible type of deep well pump. Miscellaneous units featured in the new book include a new "motor-mount" centrifugal pump designed primarily for air conditioning service but applicable for booster service, general circulating service, swimming pools, lawn sprinkling, and industrial plant service. THE DEMING CO., SALEM, OHIO.

Allis-Chalmers line — The complete line of Allis-Chalmers industrial equipment is pictorially described in a new revised general catalog entitled "Presenting the Allis-Chalmers Line." Illustrated and described along with its crawler tractors and wheel tractors and motor graders, are A-C's motor scrapers and wagons and the expanded line of pull-type scrapers. A 10-page sec-

tion in the catalog is devoted to pictures and pertinent data on the selection of allied equipment and field-proved attachments engineered for use with Allis-Chalmers equipment. ALLIS-CHALMERS MFG. CO., MILWAUKEE 1, WIS.

Masonite Presdwood—A new 32-page publication has been designed as a guide for the selection, application and finishing of Masonite Presdwood products as they are used in building construction and remodeling. The booklet is broken down into four sections: The first, entitled Product Data, describes and gives the physical properties of the Presdwood product; the second on working provides data on tooling, fastening, bending, cabinet details and finishing; a third section is devoted to application; and the fourth provides architectural specifications. MASONITE CORP., 111 W. WASHINGTON ST., CHICAGO 2, ILL.

Finishing machines—Portable finishing machines for highway, airport, municipal and special concrete slab finishing are described in a new 16-page booklet. Closeups of operating sections and complete machine specifications are included. Other sections point out the specific advantages of the Flex-Plane's Detroit Special. Bulletin P-111, THE FLEXIBLE ROAD JOINT MACHINE CO., WARREN, OHIO

Swimming pools—Those interested in swimming pools might profit by reading "Trends in Swimming Pool Design", a 20-page treatise based upon the experience of several American designers. It purports to present the latest concepts with regard to basic planning, pool shapes, lounging areas, wading pools and bath houses and covers various types of construction; modern trends in pool lighting; color in the pool; data on filtering, recirculating and chlorinating systems; and developments in pool fittings and accessories. ELGIN-REFINITE, SWIMMING POOL DEPT., ELGIN, ILL.

Scaffolding—"Scaffolding Methods" is the title of a new 4-page quarterly publication devoted exclusively to scaffolding techniques. One of the main features of the publication is the use of word-picture stories on how scaffolding problems on various building projects were solved. The periodical also will explain new products manufactured by THE PATENT SCAFFOLDING CO., INC., 38-21 12TH ST., LONG ISLAND CITY 1, N. Y.

ADVERTISERS IN THIS ISSUE

Acker Drill Co. ... 107
Acme Equipment Co. ... 120
Allis-Chalmers Mfg. Co. (Tract.) ... 90, 91
American Bitumuls & Asphalt Co. ... 37
American Creosoting Co. ... 89
Armco Drainage & Metal Products, Inc. ... 2nd Cover

Bailey-Lewis-Williams, Inc. ... 148
Barber-Greene Co. ... 148
Belmont Iron Works ... 96
Bethlehem Steel Co. ... 44
Bruning Co., Inc., Charles ... 8
Buchanan Lumber Co. ... 114
Butler Mfg. Co. ... 78
Byers Co., A. M. ... 145

Celotex Corp., The ... 58
Cement Gun Company ... 104
Chapman Valve & Mfg. Co. ... 20
Chevrolet Motor Div., General Motors Corp. ... 70, 71
Clearprint Paper Co. ... 67
Coxhead Corp., Ralph C. ... 97
Cummins Engine Co. ... 76, 77

Deming Co., The ... 72
Dicalite Div., Great Lakes Carbon Corp. ... 60
Dravo Corp. ... 118
Dresser Mfg. Div., Dresser Industries ... 73
Dudgeon, Inc., Richard ... 116

Economy Forms Corp. ... 96
Eimco Corp., The ... 82, 83
Electric Steel Foundry ... 65
Erie Strayer Co. ... 107

Fairbanks-Morse Co. ... 3rd Cover
Flint Steel Corp. ... 88
Tractor & Implement Div., Ford Motor Co. ... 9
Fort Pitt Bridge Works ... 146
Foster Co., L. B. ... 33
Foundation Equipment Corp. ... 118
Fruehauf Trailer Co. ... 100

Gardner-Denver Co. ... 12-13
Getman Bros. ... 96
Griffin Wellpoint Corp. ... 121
Gunite Concrete & Const. Co. ... 108
Gurley, W. & L. E. ... 111

Harnischfeger Corp. ... 1
Heltzel Steel Form & Iron Co. ... 29
Hewitt-Robins, Inc. ... 51, 52, 53
Homelite Corp. ... 81

Insurance Co. of North Amer. ... 86
International Harvester Co. ... 105
Irving Subway Grating Co. ... 68

Jaeger Machine Co. ... 88
Johns-Manville Corp. ... 34, 64
Joy Mfg. Co. ... 122

Kern Instrument Co. ... 123
Kerrigan Iron Works, Inc. ... 101
Keuffel & Esser Co. ... 103

Layne & Bowler, Inc. ... 148
LeRoi Co. ... 150
LeTourneau-Westinghouse Co. ... 38, 39
Lipe-Rollway Corp. ... 66
Lone Star Cement Corp. ... 16

MacArthur Concrete Pile Co. ... 108
Mahon Co., R. C. ... 15
Marion Power Shovel Co. ... 142
McGraw-Hill Book Co. ... 118
McKiernan-Terry Corp. ... 110
Merriman Bros., Inc. ... 102
Moretrench Corp. ... 96

National Surety Corp. ... 120
Northwest Engineering Co. ... 3

Otis Elevator Co. ... 62, 63
Owen Bucket Co. ... 92
Owens Corning Corp. ... 43

Peerless Pump Div., of Food Machy. Corp. ... 47
Pennsylvania Drilling Co. ... 116
Phoenix Bridge Co. ... 110
Pierce Governor Co. ... 85
Pittsburgh-Des Moines Steel Co. ... 69
Pittsburgh Plate Glass Co. ... 61
Portland Cement Assn. ... 115
Powder Power Tool Corp. ... 49

Raymond Concrete Pile Co. ... 7
Remington Arms Co., Inc. ... 95
Republic Steel Corp. ... 75
Reynolds Metal Co., Inc. ... 112
Roebling's Sons Corp., John A. ... 10
Ruberoid Co. ... 117
Russell, Burdsall & Ward Bolt & Nut Co. ... 106
Rust-Oleum Corp. ... 149
Ryerson & Sons, Inc., Jos. T. ... 18

St. Paul & Tacoma Lumber Co. ... 14
Salem Tool Co. ... 59
Sauerman Bros., Inc. ... 122
Seaman Motors ... 98, 99
Servicised Products Corp. ... 97
Sherman Products, Inc. ... 119
Sika Chemical Corp. ... 116
Sonoco Products Co. ... 56, 57
Spencer, White & Prentis, Inc. ... 121
Sprague & Henwood, Inc. ... 96
Standard Dry Wall Products ... 113
Standard Steel Spring Div., Rockwell Spring & Axle Co. ... 11
Stang Corp., John W. ... 6

Terry Steel Contractors, Inc. ... 48
Texas Co. ... 4, 5
Timber Engineering Co. ... 74
Timber Structures, Inc. ... 84
Timken Roller Bearing Co. ... 4th Cover
Tinney Drilling Co. ... 110

Union Mercantile Co. ... 114
Unit Crane & Shovel Corp. ... 87
U. S. Rubber Co. ... 93
United Steel Fabricators, Inc. ... 104
Universal Manufacturing Corp. ... 2

Vulcan Iron Works ... 84

Walker Process Equip. Co. ... 114
Wisconsin Motors Corp. ... 108

Professional Services ... 141

SEARCHLIGHT SECTION

(Classified Advertising)

H. E. Hilty, Mgr.

Employment ... 133, 134
Educational ... 134
Notices
Proposal ... 129-132
Equipment
(For Rent, Sale, Wanted) ... 129-141

ENGINEERING NEWS-RECORD

330 West 42 St., New York 36—LOngacre 4-3000

D. S. Robertson, Advertising Mgr.
Howard T. Olsen, Business Manager

ADVERTISING REPRESENTATIVES

New York, 36—330 W. 42 St.,
M. J. Storz, E. A. Callahan, Jr.
S. Kennedy

Chicago, 11—520 No. Michigan Ave.,
F. G. Hudson, L. H. Hunt, W. G. Payne

San Francisco, 4—68 Post St.,
R. E. Dorland

Philadelphia, 3—17th and Sansom Sts.,
A. B. Cozzens, D. G. Jensen

Cleveland, 15—Hanna Bldg.,
E. E. Duff, Jr.

Detroit, 28—Penobscot Bldg.,
B. F. Horn

St. Louis, 8—Continental Bldg.,
B. F. Horn

Los Angeles, 17—1111 Wilshire Blvd.,
H. L. Keeler

Atlanta, 3—Rhodes-Haverty Bldg.,
W. D. Lanier

Dallas, 1—First National Bank Bldg.,
J. H. Cash

OTHER SALES OFFICES:

Pittsburgh, 22—738-39 Oliver Bldg.
Boston, 16—350 Park Square Bldg.
London, McGraw-Hill House

EDITORIALS

Why did the compact plan fail?

LAST WEEK the U. S. Supreme Court decreed that New York City may divert in the future an additional 360 mgd from the interstate Delaware Basin (ENR June 10, p. 24). And it is significant to note that the court followed exactly the recommendation of its capable special master for this case, Kurt F. Pantzer. The master, acting as arbiter, had brought about through effective pretrial conferences a situation wherein all major differences had been ironed out. Actually, what settled the basic questions at issue was general acceptance of a new formula for releasing water from storage, arrived at fully a year ago (ENR June 25, 1953, p. 27) by engineers for the three major parties in the case.

For all intents and purposes, an interstate accord had been reached; the court merely gave its blessing and retained jurisdiction.

This raises the question as to why a master for the Supreme Court succeeded in doing what the Interstate Commission on the Delaware River Basin failed to accomplish. Its "Incodel plan," produced after long deliberation, was designed to meet the pressing needs of New York City and New Jersey and still protect Pennsylvania's rights to water it may need in the future. Yet Pennsylvania would not accept it. Was it too inflexible? Did it make inadequate provision for unforeseen developments in the future?

An answer to those questions would be of great value in other regions where the use of interstate waters is at issue, for the compact route certainly is preferable to an appeal to the Supreme Court.

Engineers should be named

NOW THAT THE WAY has been cleared for an early start of construction of the power features of the St. Lawrence development, President Eisenhower has an opportunity to expedite actual start of work by rectifying a mistake made last fall when he named the Secretary of the Army and the Chairman of the Federal Power Commission as the two U. S. representatives on the Joint Board of Engineers for that project.

Neither of the men named is an engineer. And neither has the training or experience needed to fulfill the duties assigned to him by the International Joint Commission when it required that such a board be created—a fact which the President recognized in naming engineers as alternates to the official U. S. representatives. For it should be noted that those duties, according to the IJC, "shall be to review and coordinate and, if both governments so authorize, approve the plans and specifications of the works and the programs of construction . . . and to assure the construction of the work in accordance therewith as approved."

Engineers Joint Council made a formal protest to the President over this appointment of non-engineers to an engineer board soon after the appointments were announced last fall. In response, Sherman Adams, Assistant to the President, stated that the President considered it important that the U. S. representatives be "the heads of the principal agencies which will have to take action on behalf of the United States in this matter rather than subordinates who could act only after consultation with their superiors." Mr. Adams stated further that Maj. Gen. Bernard L. Robinson, Deputy Chief of Engineers, has been named an alternate for the Secretary of the Army on the board, and that Francis L. Adams, Chief of the Bureau of Power of the Federal Power Commission, had been named as alternate for the commission's chairman.

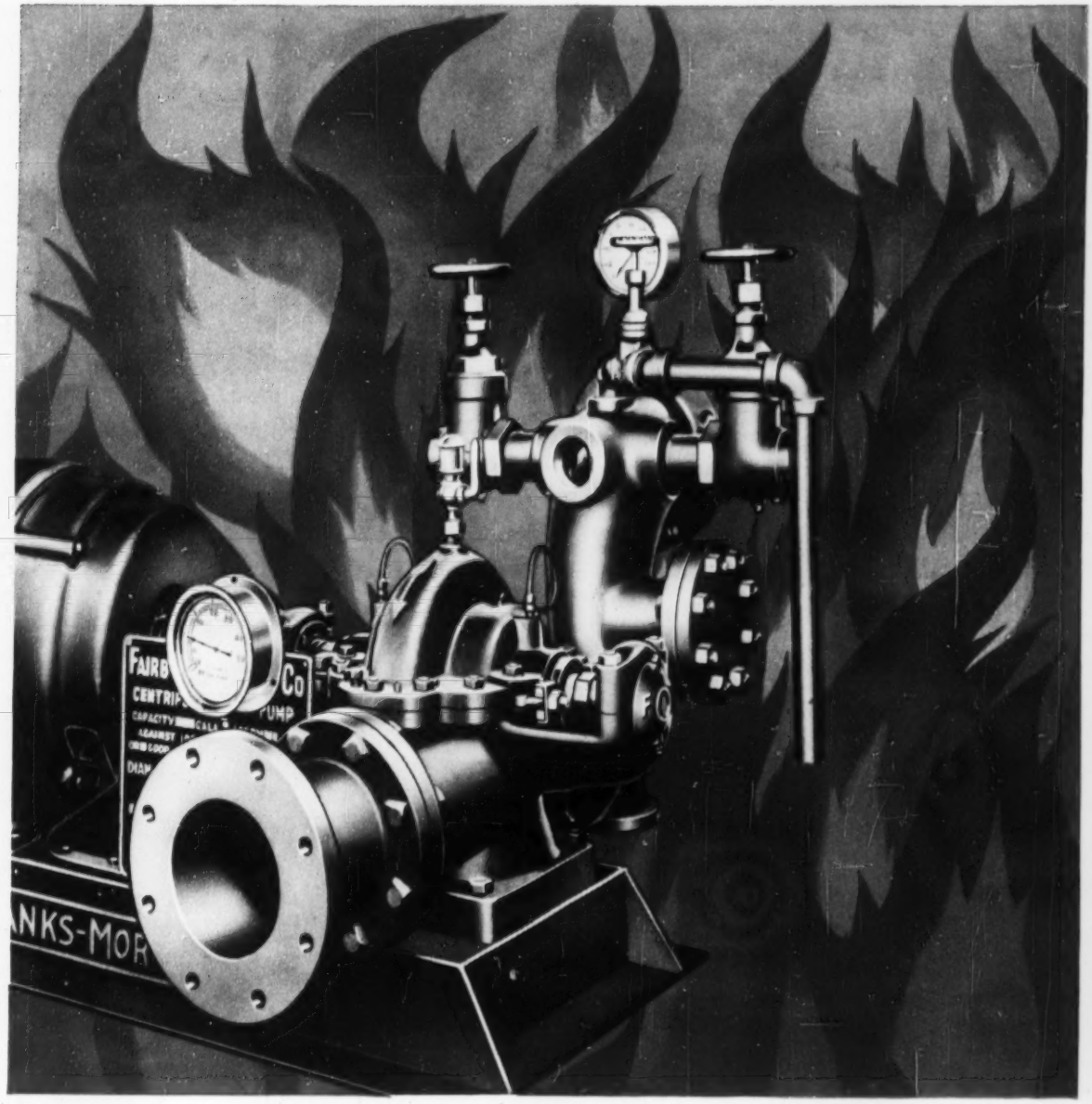
If national policy matters were involved, the President's proposal would have merit, but they are not. The questions that must be answered are engineering questions requiring knowledge of engineering and construction practice. The alternates named have the qualifications to answer them, but alternates never have full freedom of action. They should be given that freedom of action by being named the U. S. representatives on the board. A simple executive order can do that.

Bid shopping on post offices

CONTRACTS for federal building construction generally are awarded on a sealed bid basis. According to the Public Buildings Contractors Association, post-office contract procedure has not followed this pattern.

In a letter to the Postmaster General objecting to this situation, the association says, "the past procedure (of the Post Office Department) has not required that the bids be sealed, nor has it required that they be publicly read, despite the fact that the bids had to be accompanied by performance bonds which are commonly regarded in our industry as primary evidence of the bidder's responsibility. It is also a common practice for the department to reject the initial bids as excessive and request lower bids from all bidders. Without the safeguard of complete secrecy surrounding their bid, contractors are naturally reluctant to submit their best figure at first."

Such a bidding procedure is merely thinly disguised bid shopping. It is neither fair to the contractors nor in the public interest. Post offices are no different from any other public project on which competitive bids are required. Under the new lease-purchase arrangement, the construction of post offices is scheduled to be accelerated greatly beginning next year. In preparation for that program post office bidding procedure should be revised to accord with general good practice in which all bids are publicly read, with the contract going to the lowest responsible bidder.



may you never need it . . . but . . .

. . . if you do, this is the fire pump you can depend on, Fairbanks-Morse. And where else is quality, dependability more important than in a fire pump. True, they may never be called upon . . . true, they may operate but seldom, but when they are needed, they *must* be ready.

That is why no design, material or manufacturing step that can contribute to reliability . . . to unfailing operation . . . is overlooked.

That is why we say "may you never need it, but this pump will always be ready if you should."

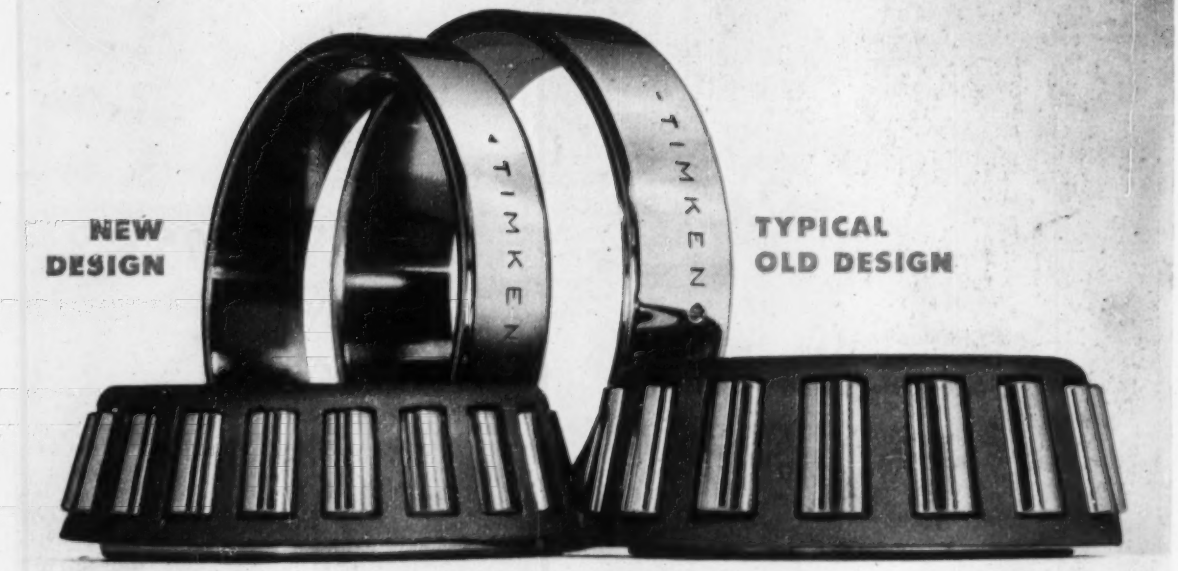
For the fire pumps you can depend on, contact your nearby Fairbanks-Morse Branch, pump dealer, or Fairbanks, Morse & Co., world's largest manufacturer of a complete pump line, Chicago 5, Ill.

FAIRBANKS-MORSE

a name worth remembering when you want the best

PUMPS • SCALES • DIESEL LOCOMOTIVES AND ENGINES • ELECTRICAL MACHINERY • RAIL CARS • HOME WATER SERVICE EQUIPMENT • FARM MACHINERY • MAGNETOS

The Timken Company pioneers again:



New TIMKEN® conveyor idler bearings save money, space, weight

THE Timken Company announces two new tapered roller bearings that cost substantially less than the Timken® bearings now used in heavy-duty conveyor idlers. They are considerably smaller in width and outside diameter, weigh 25% less. Yet they have ample load-carrying capacity.

This is the latest achievement of Timken Company research and engineering, which have pioneered many important advances in steel, surface finish and design of tapered roller bearings.

With the new Timken bearings you'll get all the proven advantages of Timken conveyor idler bearings, but at lower cost than ever.

Timken bearings' true rolling motion and extremely smooth surface finish practically eliminate friction. There's less sliding between idlers and belt.

Full line contact between rollers and races gives Timken bearings the high load capacity you need in heavy duty conveyor applications. And Timken bearings aren't just lubricated for "life", but lubricated yearly, or as conditions require, to insure *long* life. Fresh lubricant ends any chance of gummy, sticky, jammed bearings.

If you haven't seen the new Timken bearings yet, call your Timken Company representative or write: The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ont. Cable address: "TIMROSCO".

Wherever the going's tough industry turns to

TIMKEN
TAPERED ROLLER BEARINGS

Typical application of Timken bearings for conveyor idlers.

NOT JUST A BALL ◯ NOT JUST A ROLLER ▭ THE TIMKEN TAPERED ROLLER ▭ BEARING TAKES RADIAL AND THRUST ▭ LOADS OR ANY COMBINATION